

SineStream: Improving the Readability of Streamgraphs by Minimizing Sine Illusion Effects

– Supplementary Material –



This supplementary material provides additional information and results about the evaluation for our submitted paper titled *SineStream: Improving the Readability of Streamgraphs by Minimizing Sine Illusion Effects*. We first show the details of the user study (Section 5.2 in the paper) and then give more results about the quantitative evaluation (Section 5.1 in the paper), **and finally an extension of case study results, in which all three baseline optimization algorithms and three ordering algorithms are applied on every single data to generate 9(3*3) graphs so that we can compare the baseline and ordering separately.**

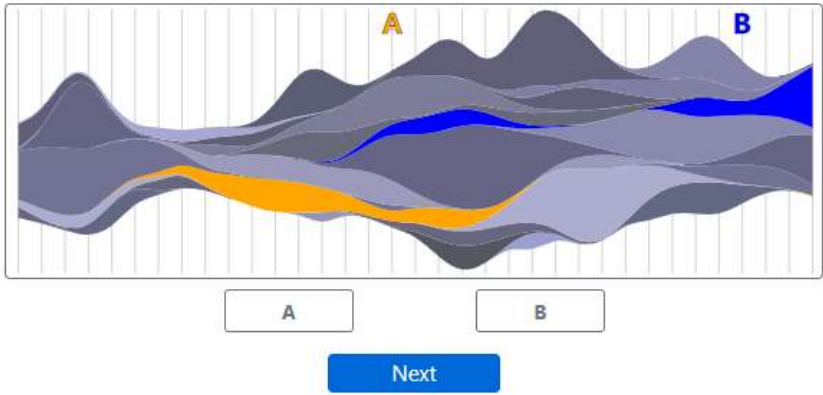
For the user study, we provide interface screenshots of the three tasks and the post-study questionnaires. The six data sets used in the user study are also presented.

While only statistic results about the quantitative evaluation are reported in the paper, this supplementary material provides more details by illustrating different streamgraph layouts ([6, 7] and *SineStream*) and reporting their metric values (wiggle_norm1 value, wiggle_norm2 value, sine illusion). The comparison is conducted on 36 real-world datasets collected from the following resources: Food and Agriculture Organization of the United Nations [1], National Bureau of Statistics of China [2], World Bank [3], World Health Organization [4], and Sports-Reference.com [5].

Part I. The details of the User Study

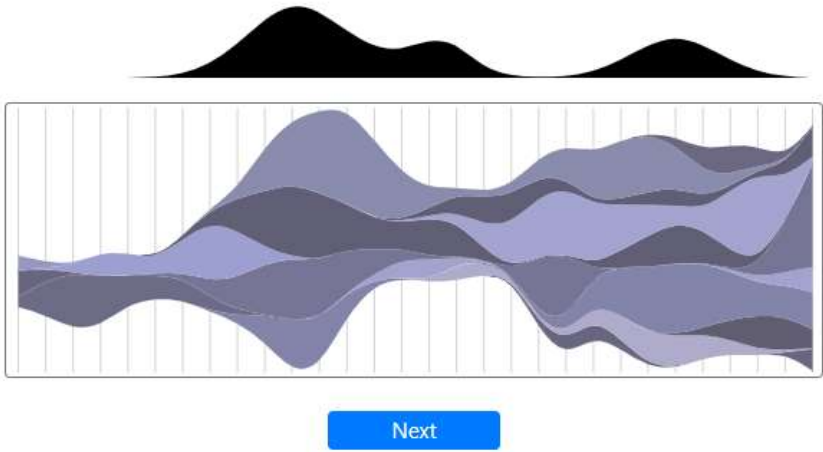
Task 1: Individual Thickness Comparison (4/18)

Which is **larger**: the thickness of **layer_1** at A or **layer_2** at B?



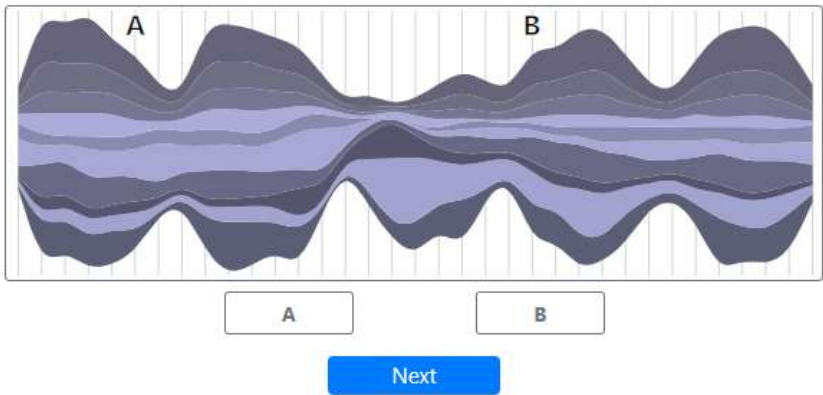
Task 2: Trend Estimation (1/18)

Which layer in the SteamGraph represent the same trend in the area chart below ?
CLICK a layer to choose it.



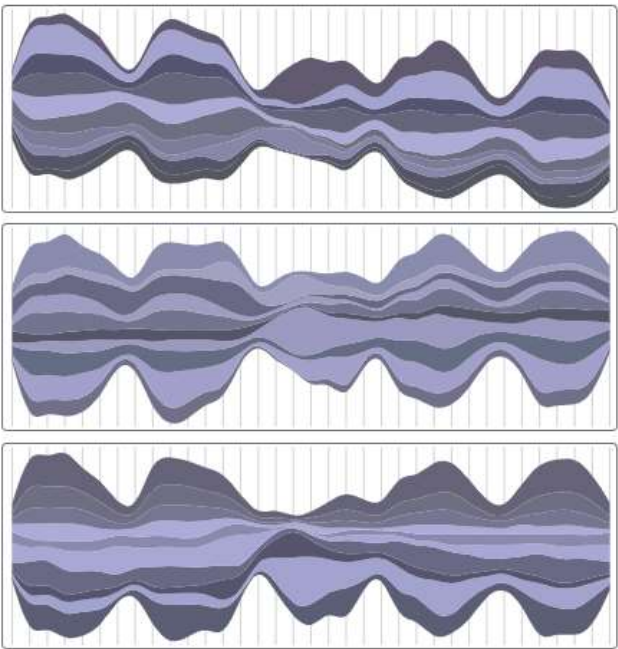
Task 3: Total Thickness Comparison (17/18)

Which is **larger** : the total thickness at **A** or at **B**?



Questionnaire : Graph Evaluation (1/6)

Please rate the extent to which you agree the following statements.(The data behind the 3 graphs below is the same.)

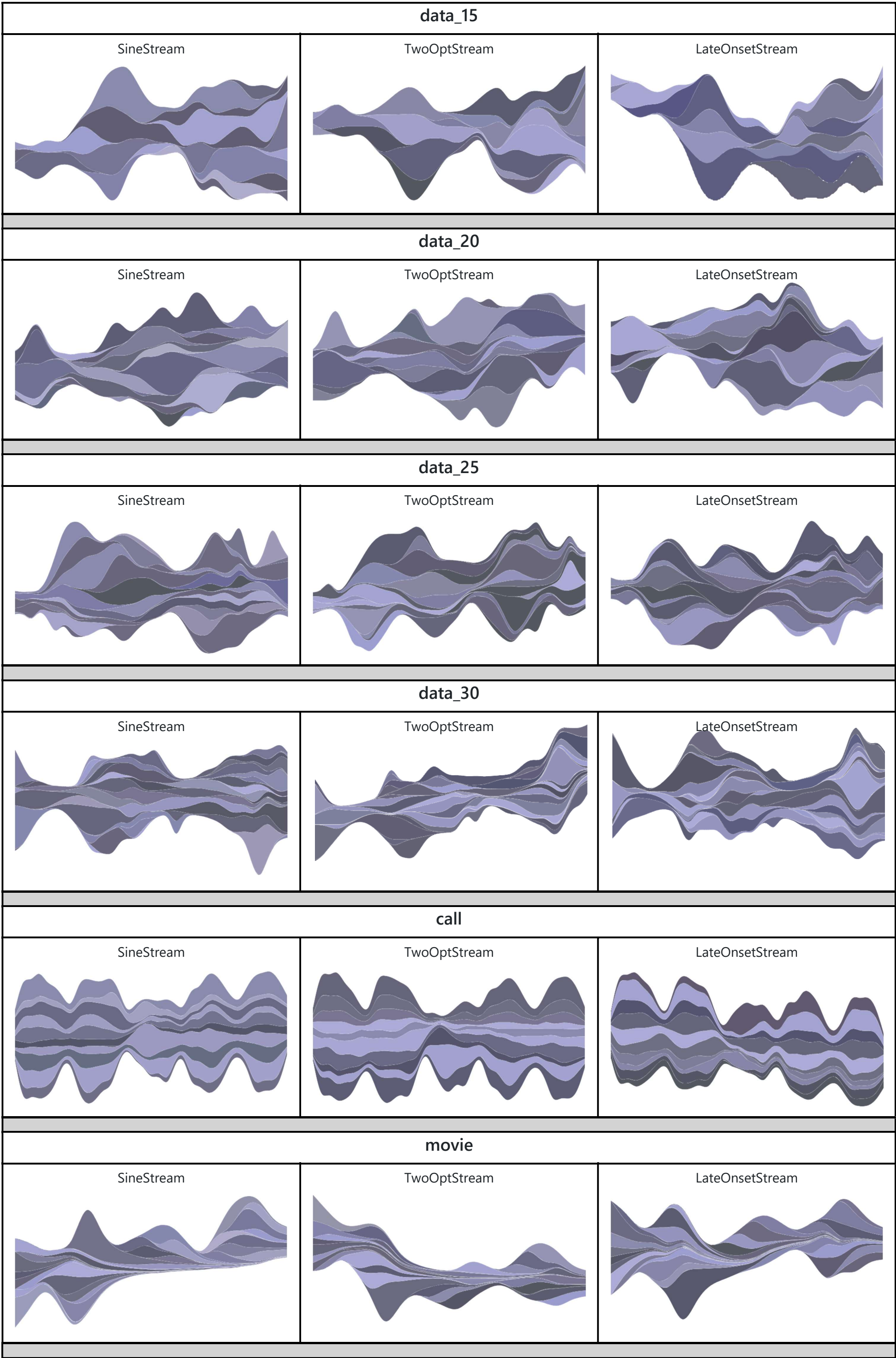


	Most Disagree	Neutral					Most Agree
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2. The graph has good readability .	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7

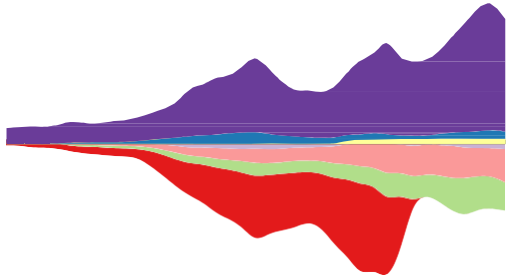
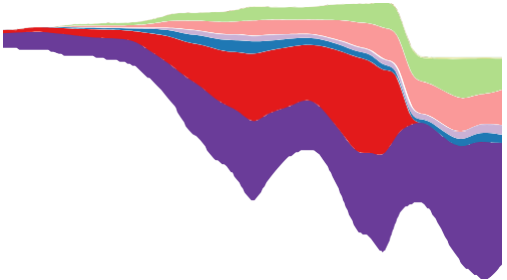
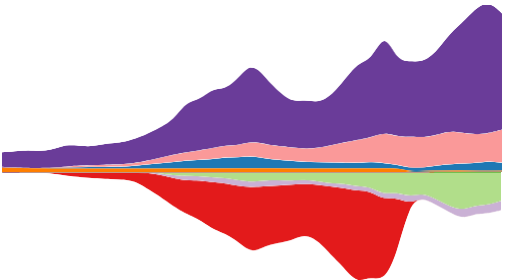
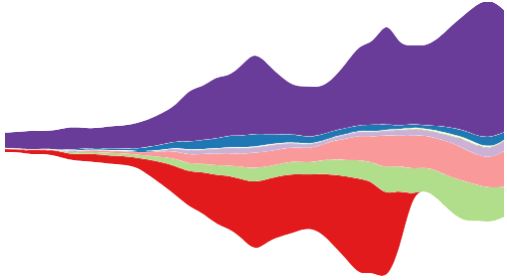
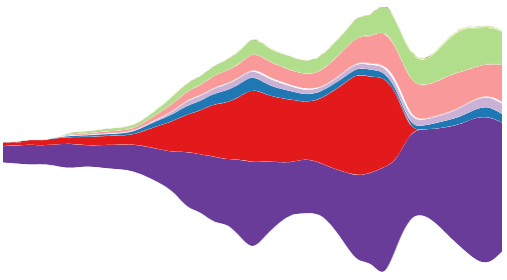
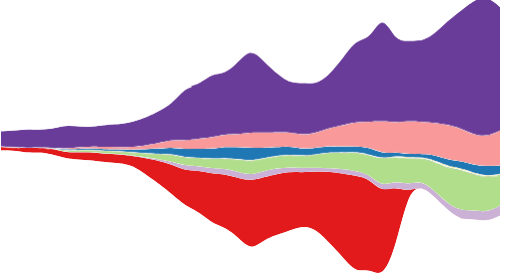
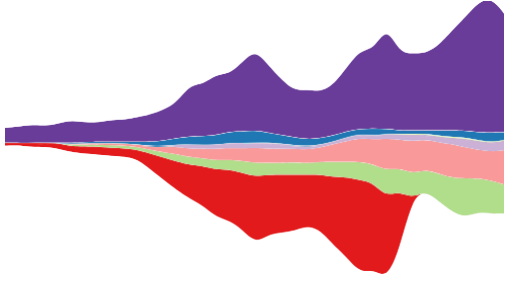
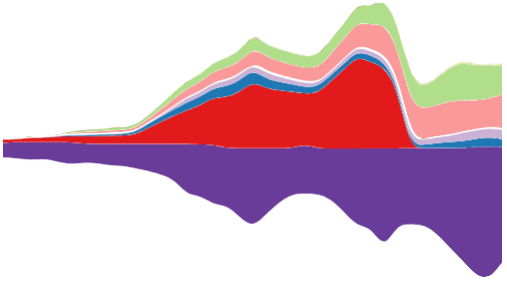
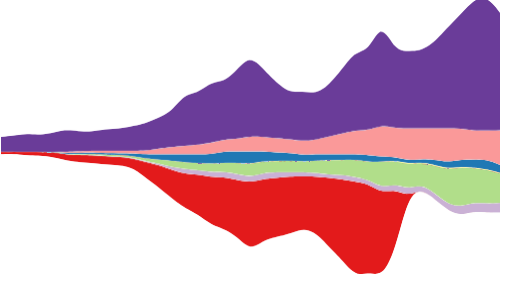
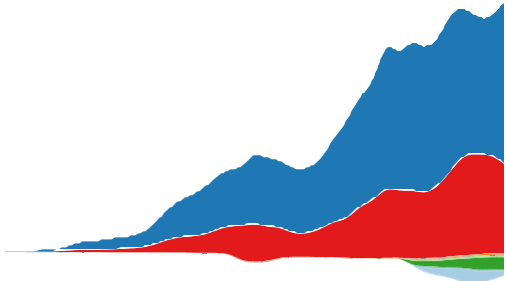

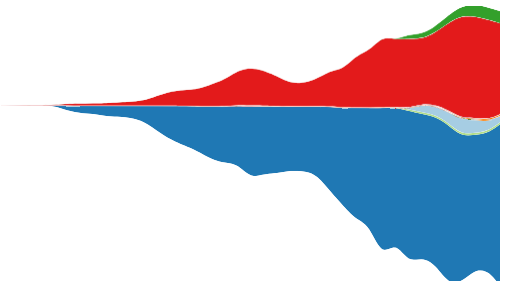
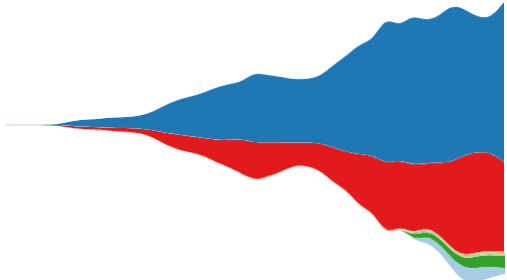
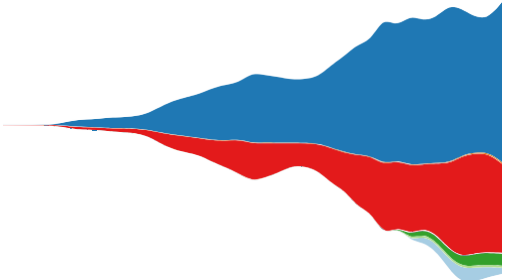

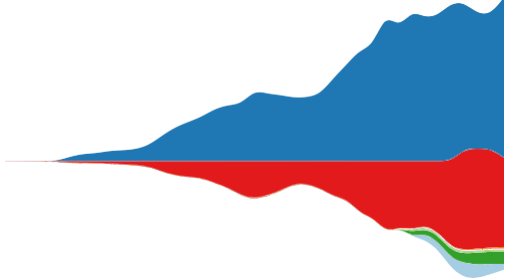
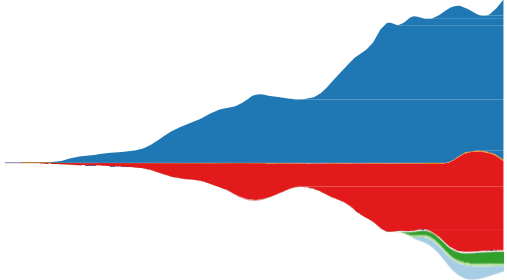
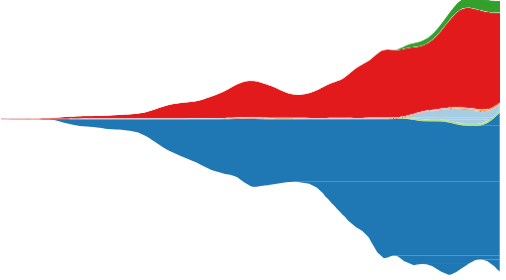
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2. The graph has good readability .	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7

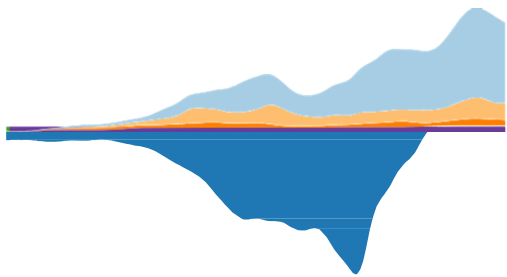
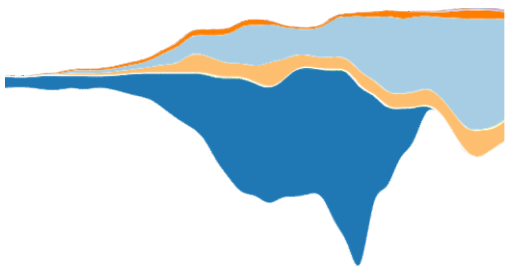
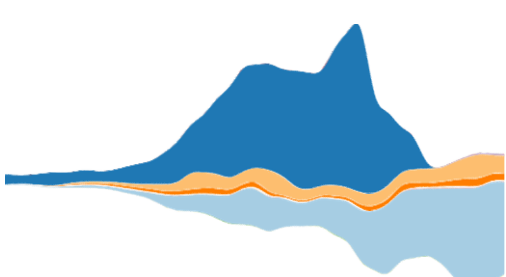
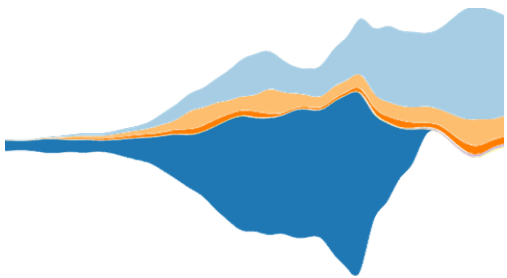
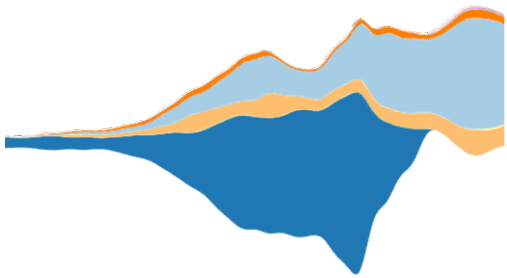

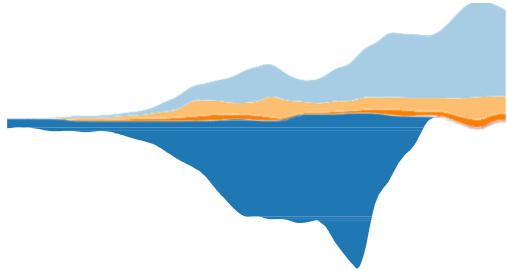
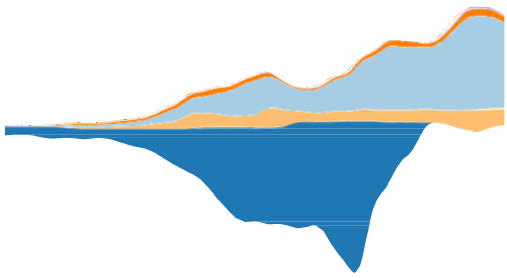
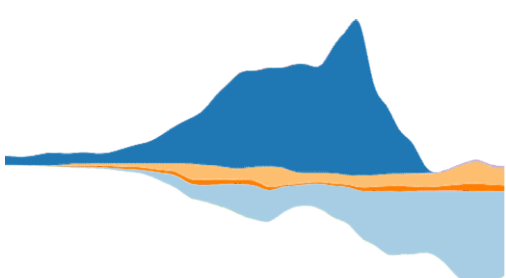
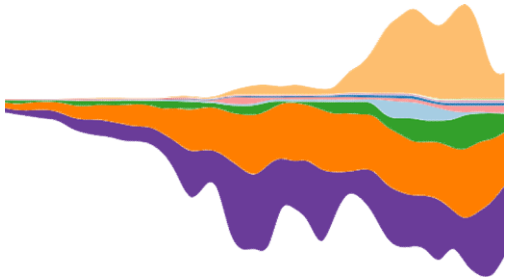
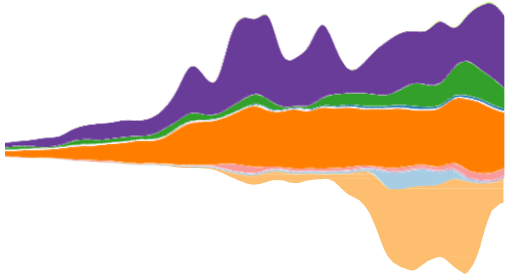
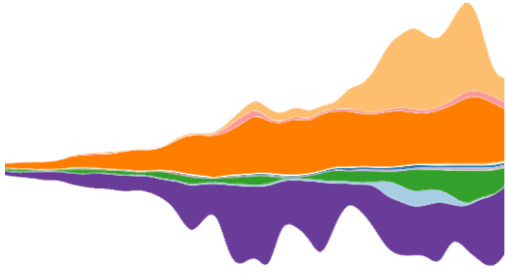
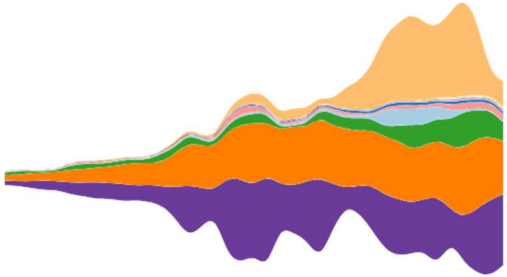
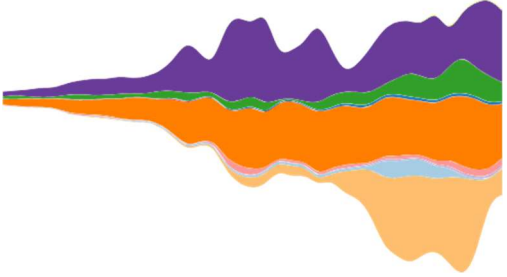
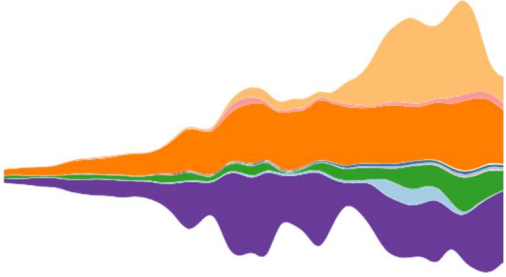
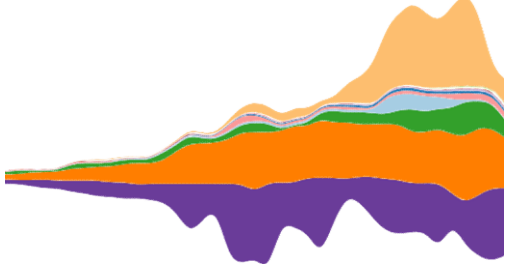
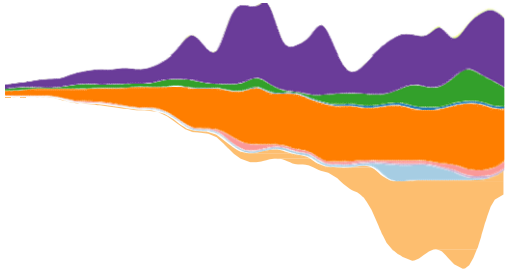
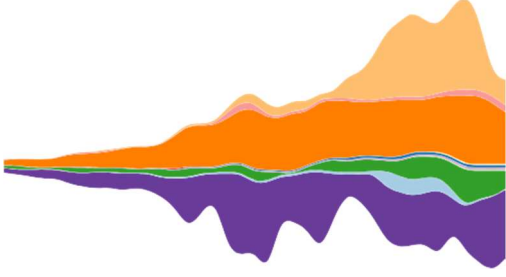
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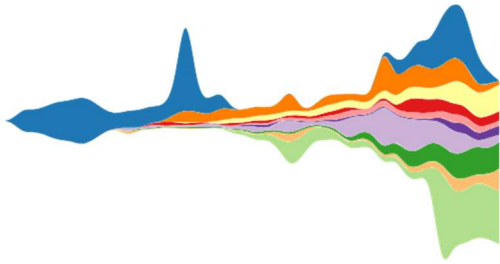
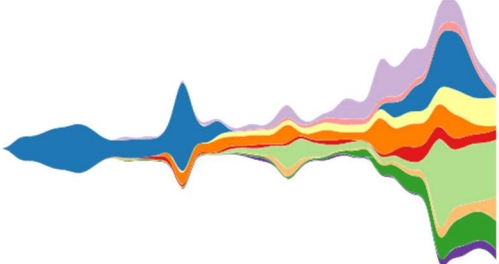
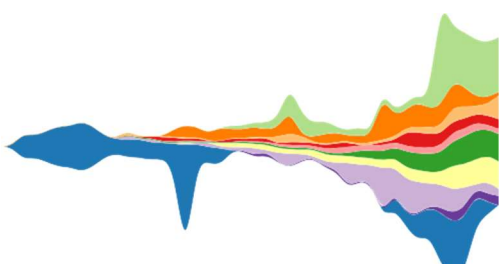
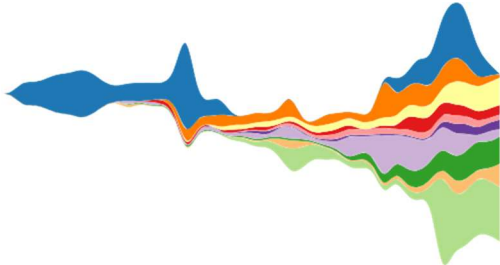
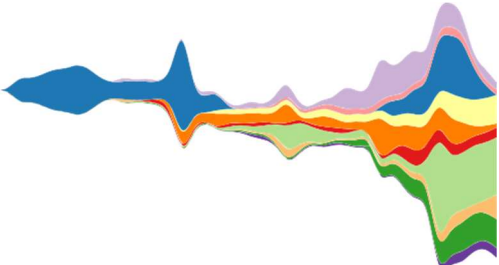
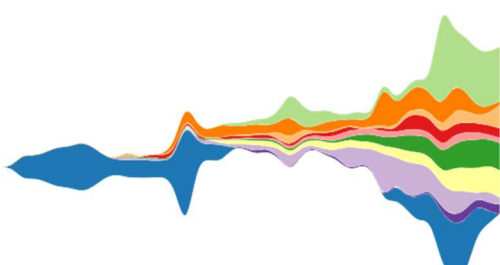
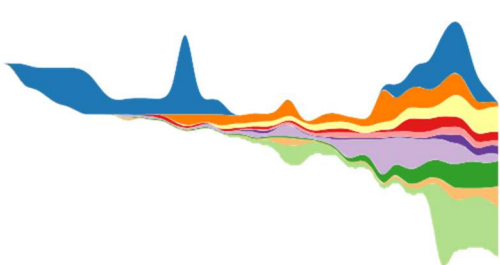
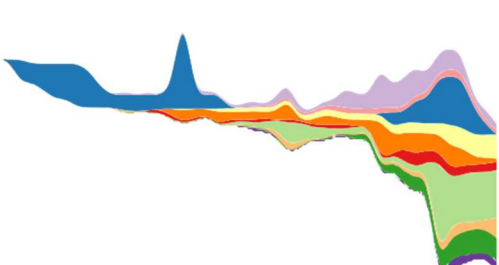
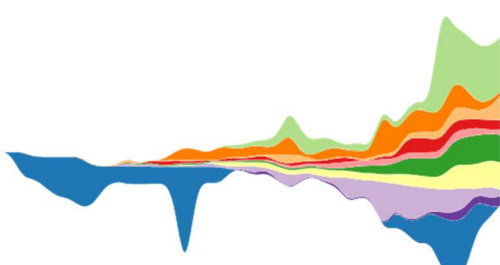
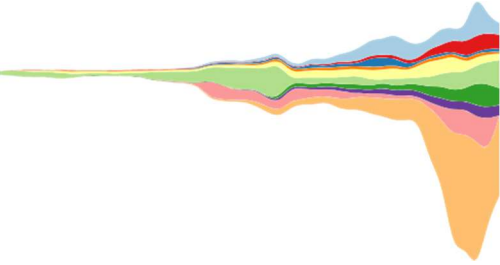
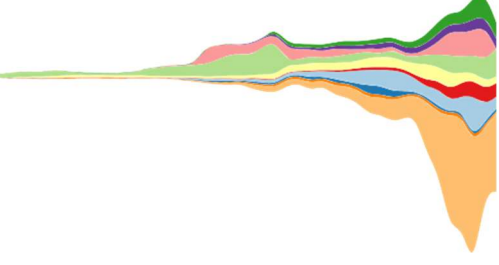
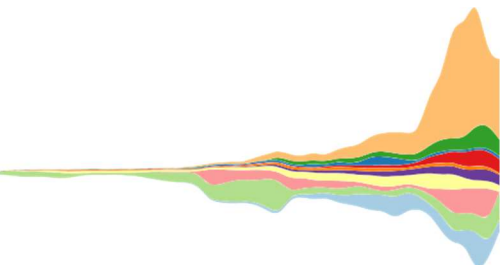
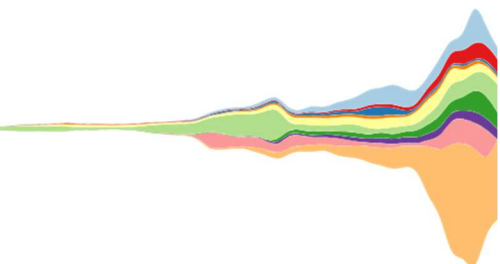
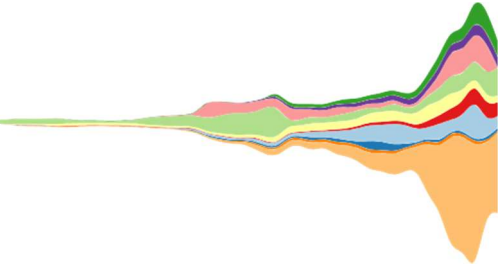
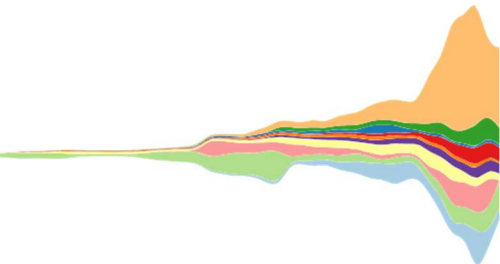
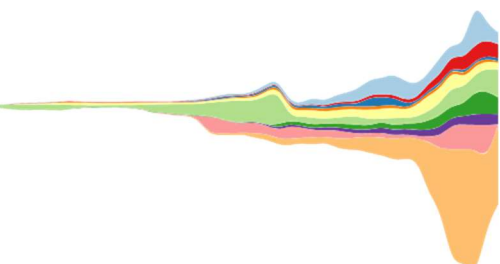
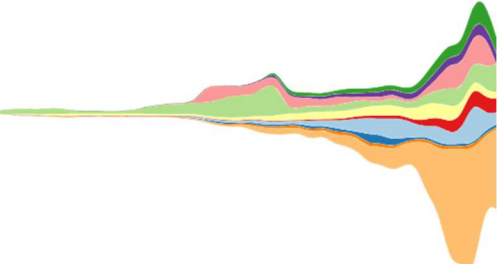
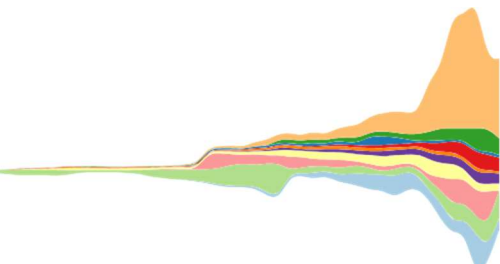
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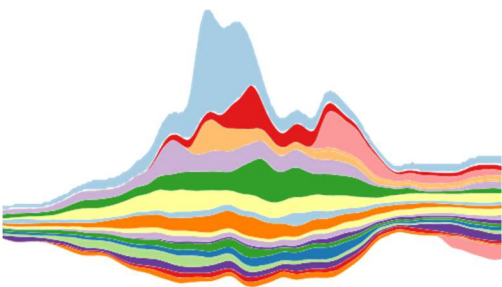
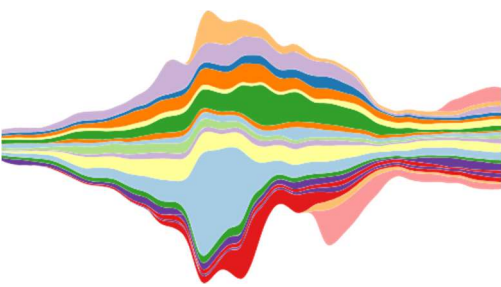
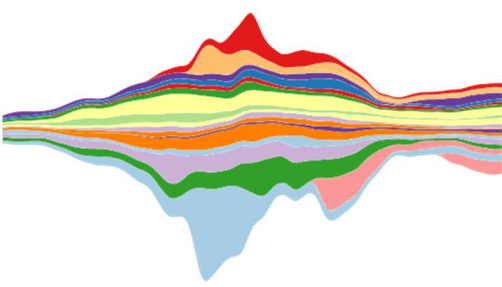
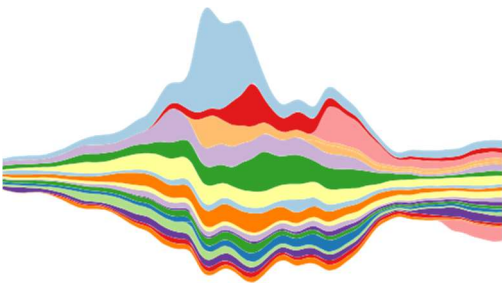
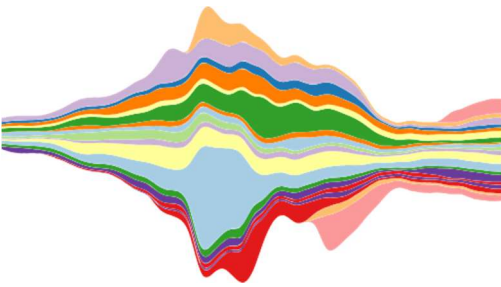
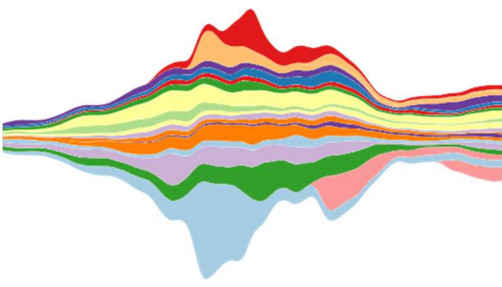
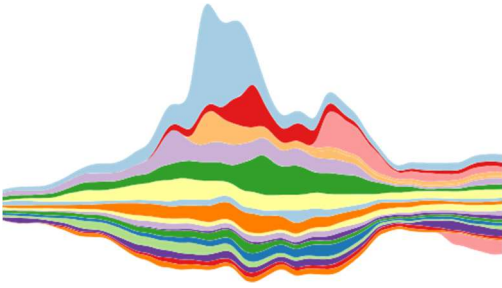
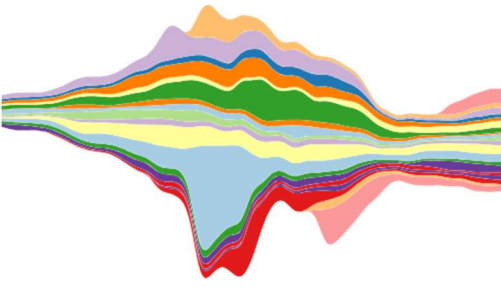
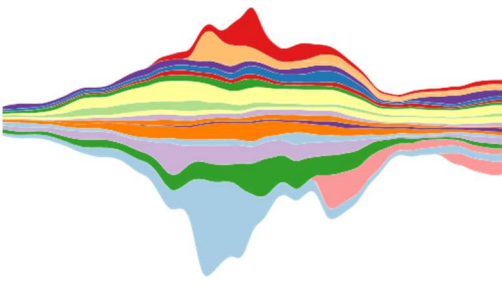
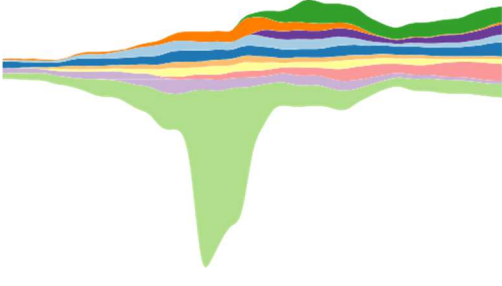
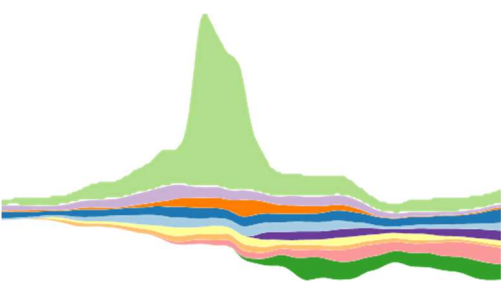
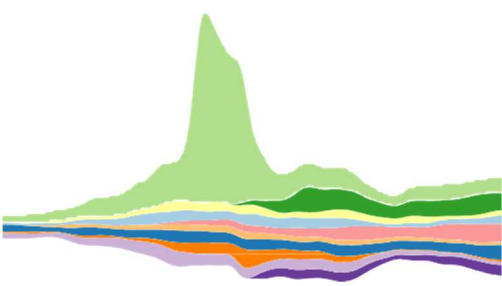
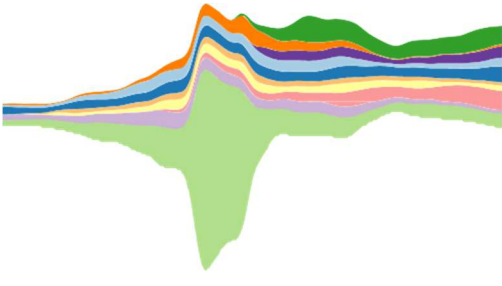
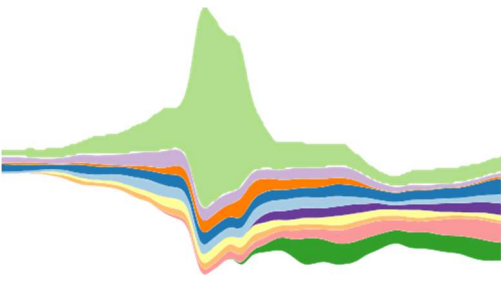
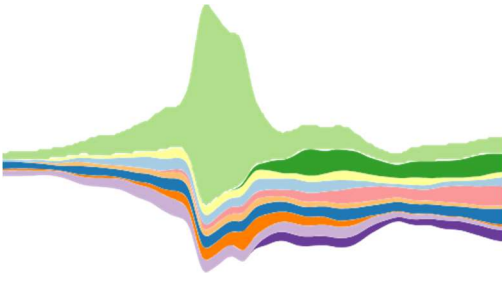
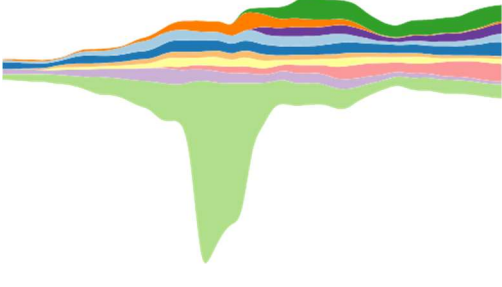
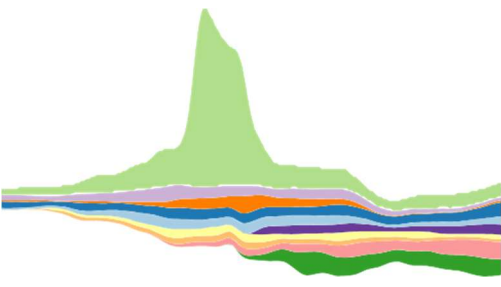
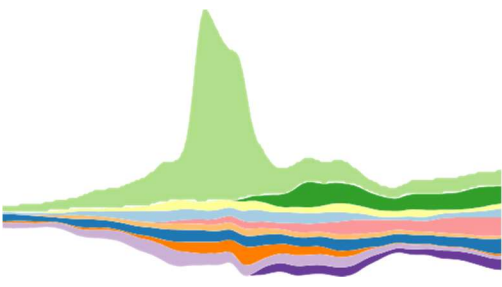


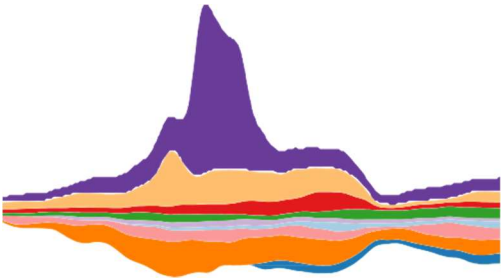
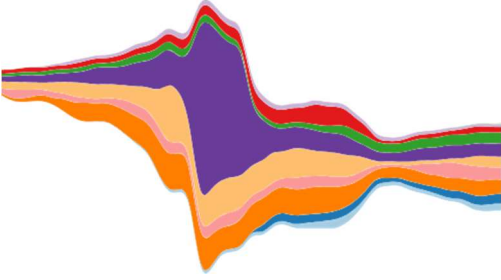
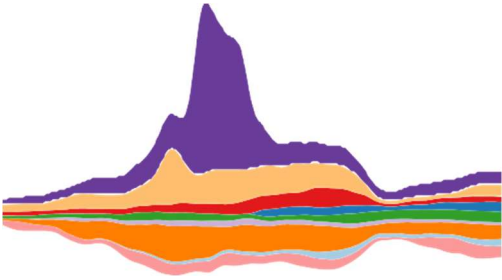
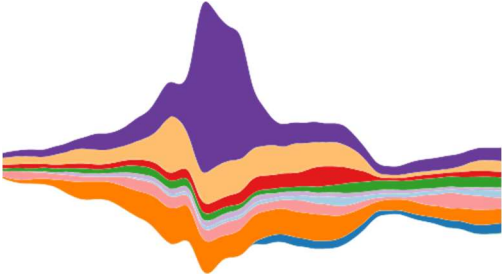
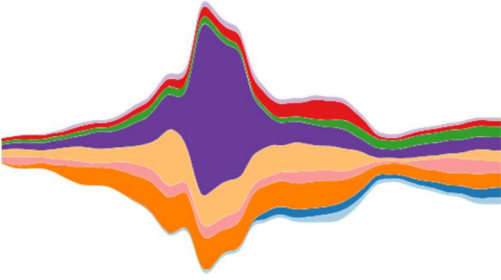
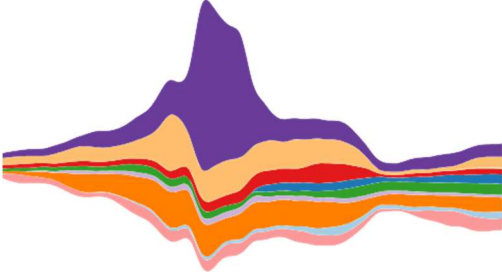
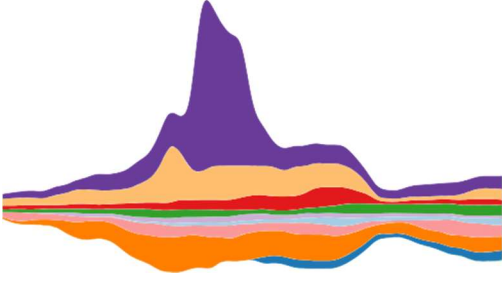
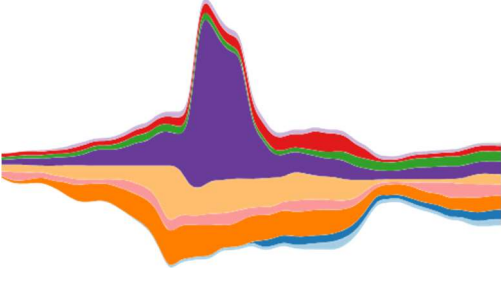
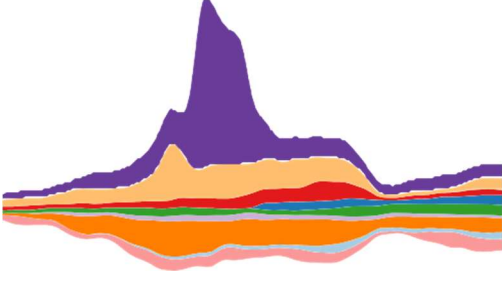
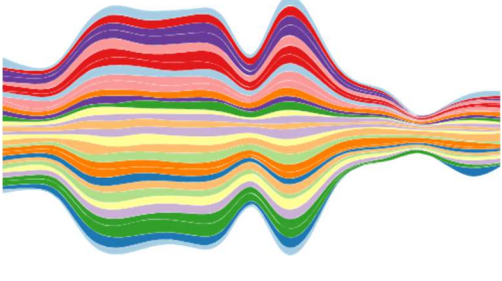
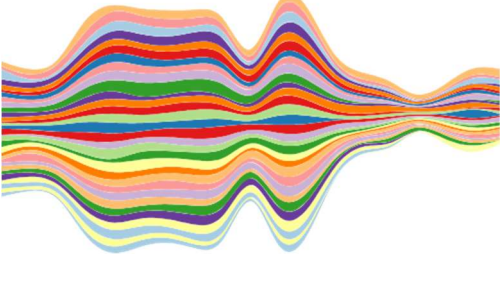
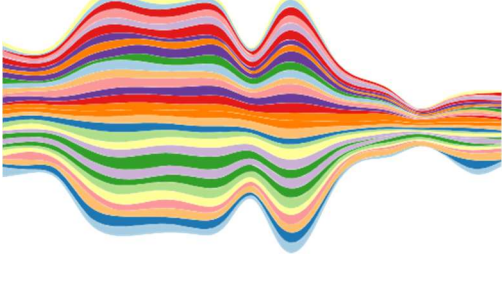
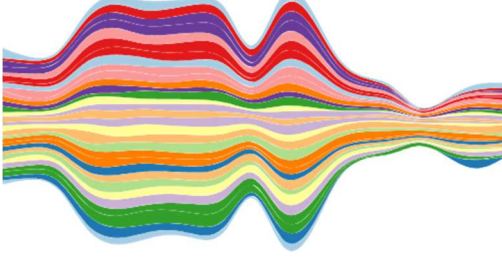
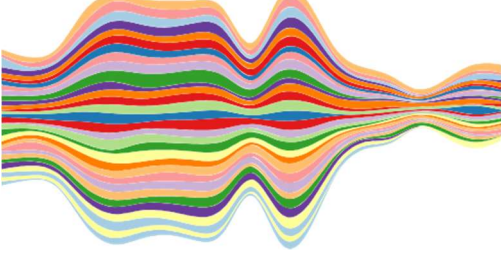
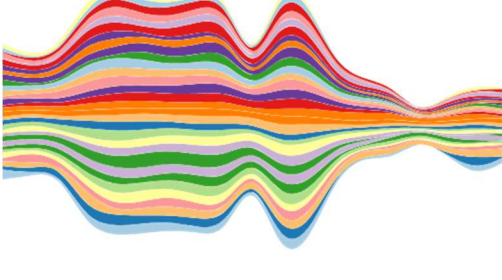
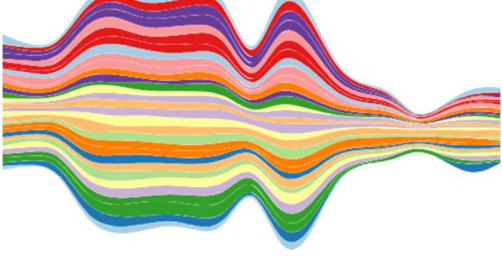
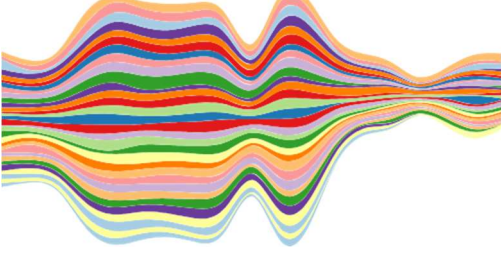
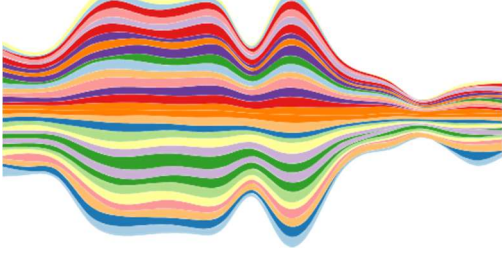
Part II. The results about the quantitative evaluation

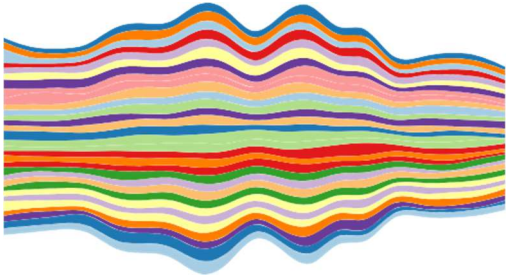
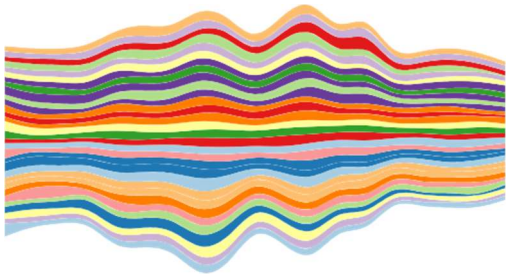
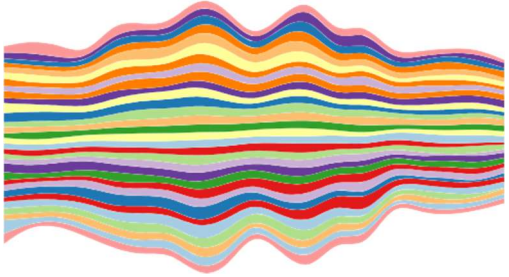
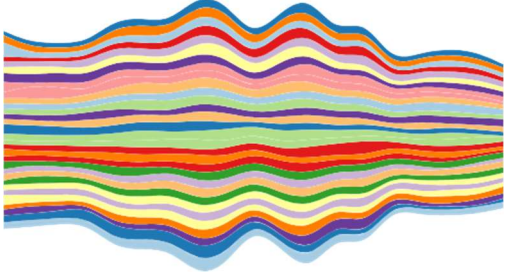
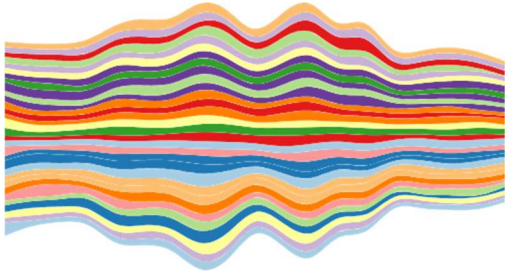
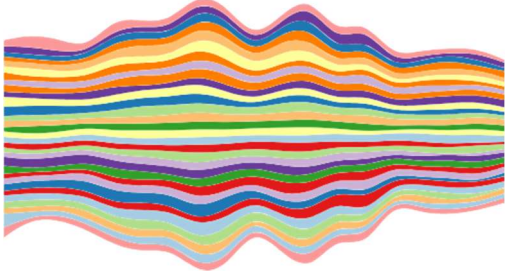
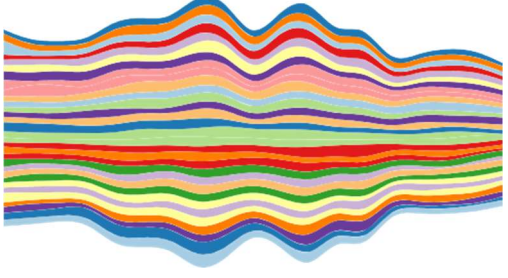
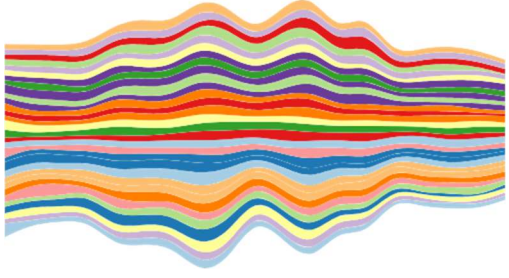

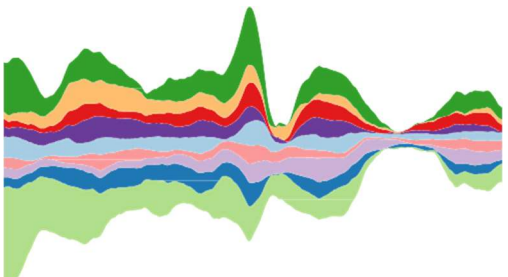
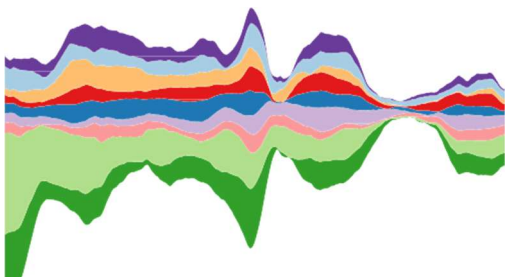
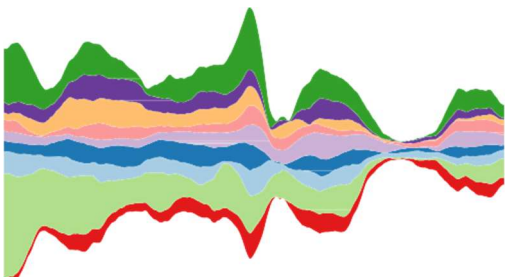
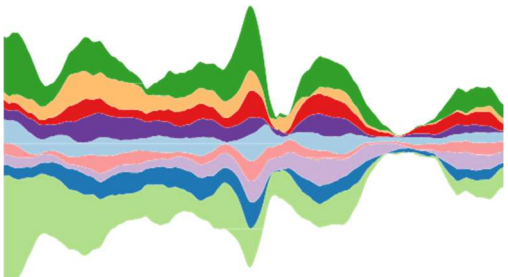
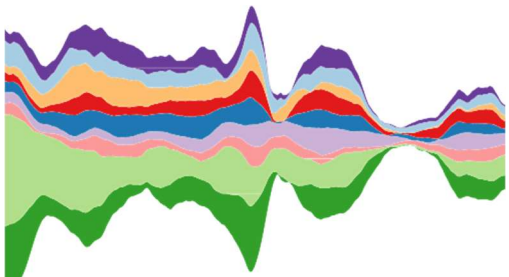
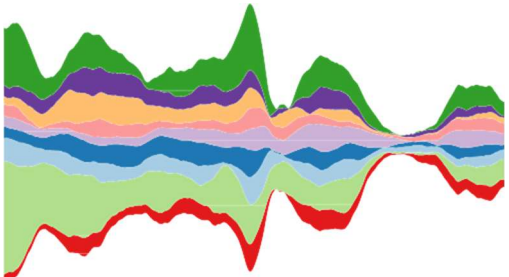
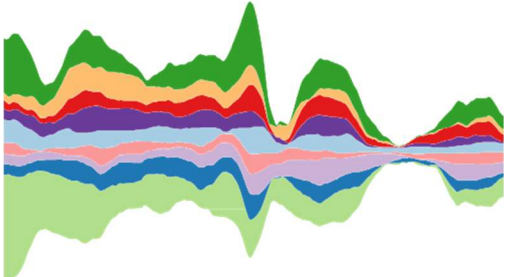
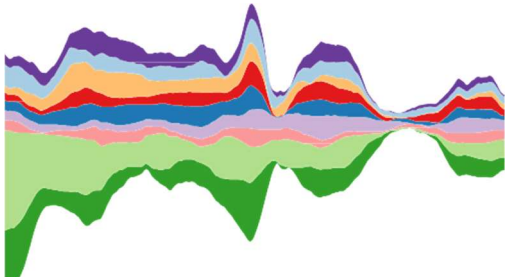
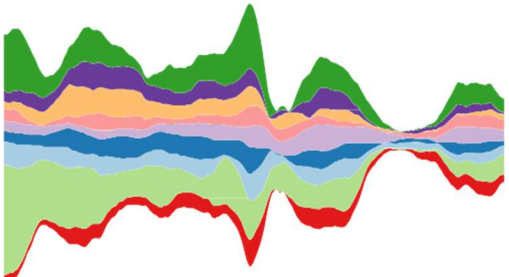
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	Wiggle _{norm2}	 Wiggle _{norm2} : 8.69E17	 Wiggle _{norm2} : 1.23E18	 Wiggle_{norm2} : 4.45E14
	Wiggle _{norm1}	 Wiggle _{norm1} : 7.10E12	 Wiggle _{norm1} : 7.81E12	 Wiggle_{norm1} : 7.05E12
agri machine_2 Layers: 15 Length: 39		Ours	LateOnset	TwoOpt
	Sine_Illusion	 Sine Illusion : 5.89E14	 Sine Illusion : 5.95E14	 Sine Illusion : 6.19E14
	Wiggle _{norm2}	 Wiggle _{norm2} : 4.64E15	 Wiggle _{norm2} : 4.65E15	 Wiggle_{norm2} : 6.19E14
	Wiggle _{norm1}	 Wiggle_{norm1} : 2.78E11	 Wiggle _{norm1} : 2.79E11	 Wiggle _{norm1} : 2.87E11

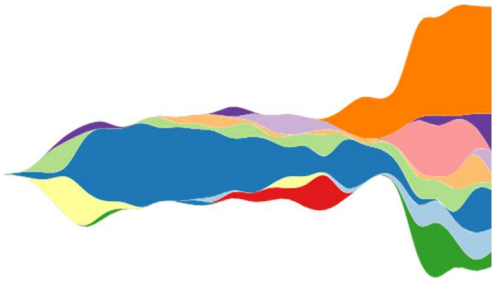
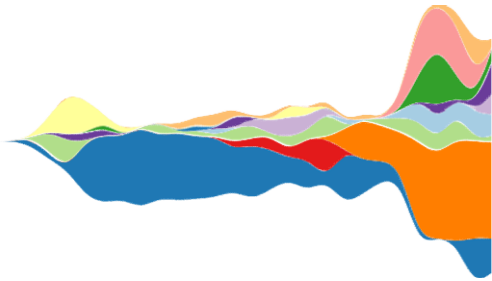
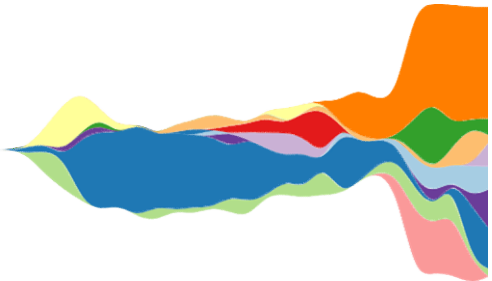

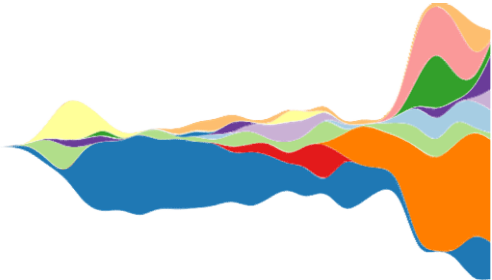
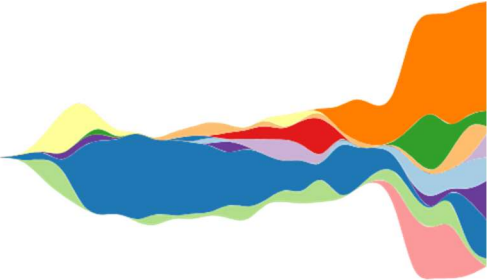
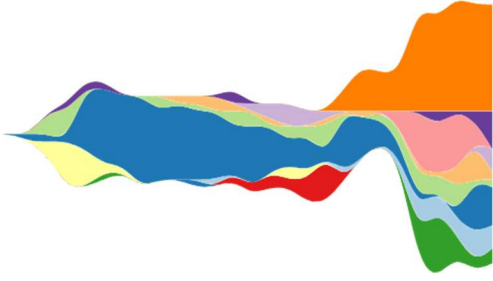
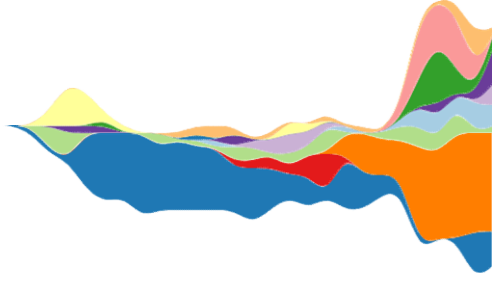
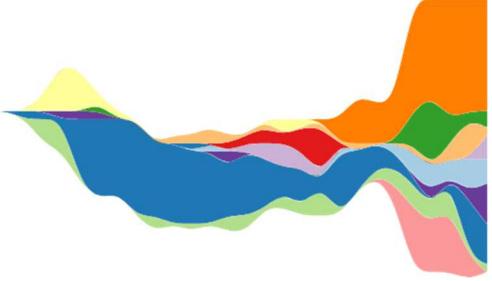
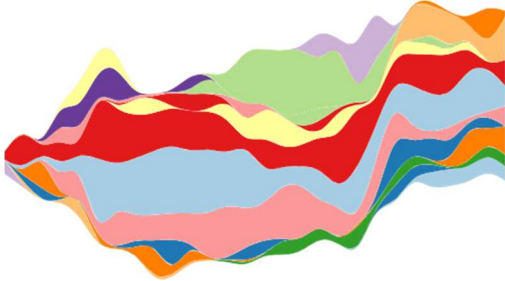
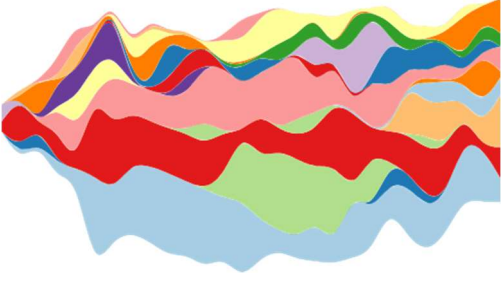
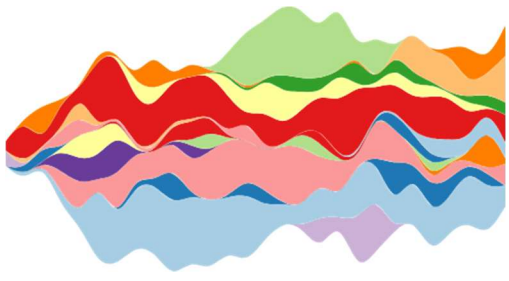
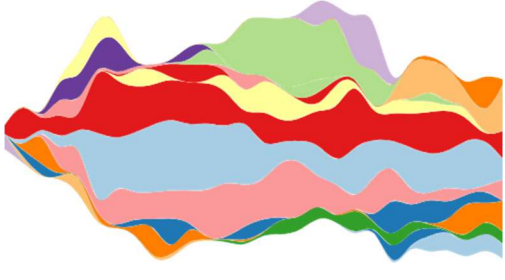
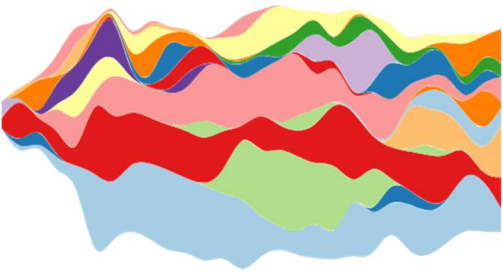
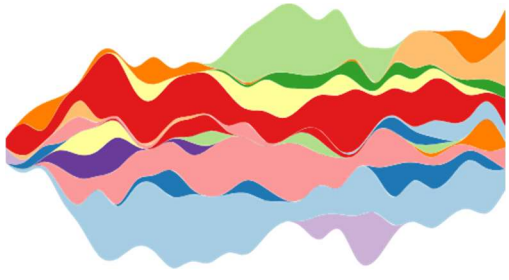
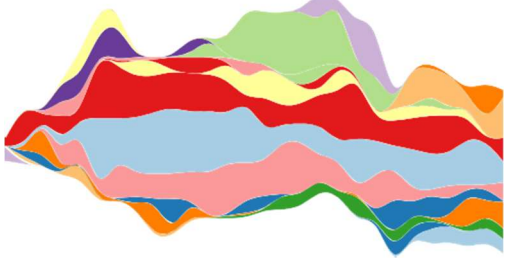
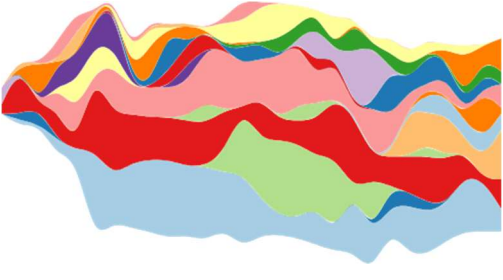
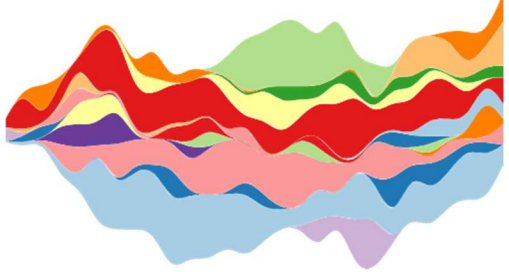
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	Wiggle _{norm2}	 Wiggle _{norm2} : 9.19E15	 Wiggle _{norm2} : 9.25E15	 Wiggle _{norm2} : 9.76E12
	Wiggle _{norm1}	 Wiggle _{norm1} : 3.17E11	 Wiggle _{norm1} : 3.18E11	 Wiggle _{norm1} : 3.18E11
agri machine_4 Layers: 15 Length: 39		Ours	LateOnset	TwoOpt
	Sine_Illusion	 Sine Illusion : 3.24E13	 Sine Illusion : 1.55E14	 Sine Illusion : 2.10E13
	Wiggle _{norm2}	 Wiggle _{norm2} : 1.05E16	 Wiggle _{norm2} : 1.23E16	 Wiggle _{norm2} : 2.10E13
	Wiggle _{norm1}	 Wiggle _{norm1} : 3.55E11	 Wiggle _{norm1} : 3.83E11	 Wiggle _{norm1} : 3.64E11

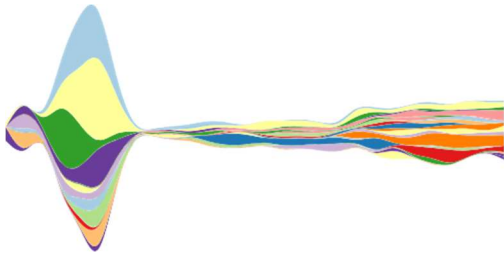
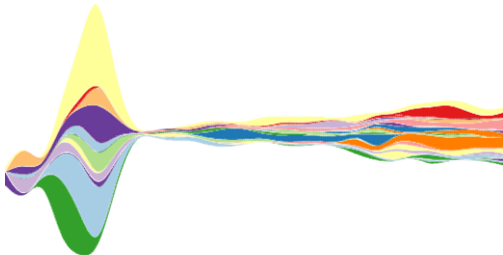
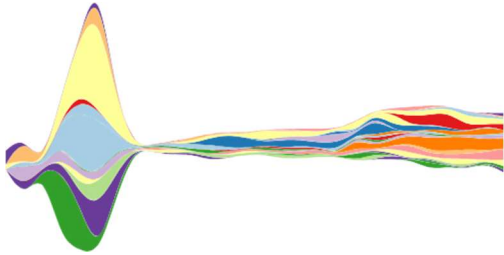
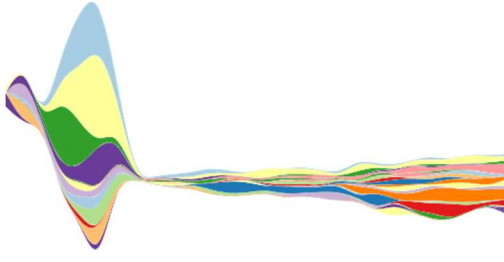
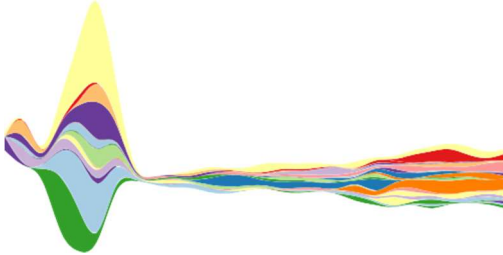
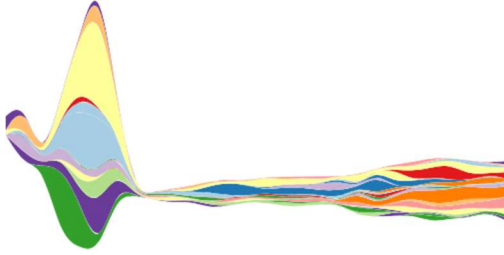
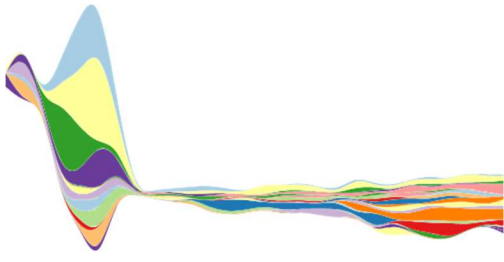
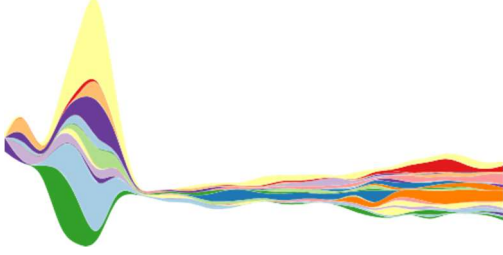
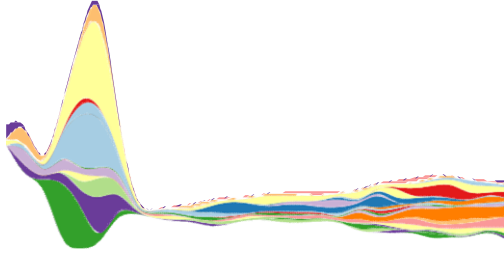
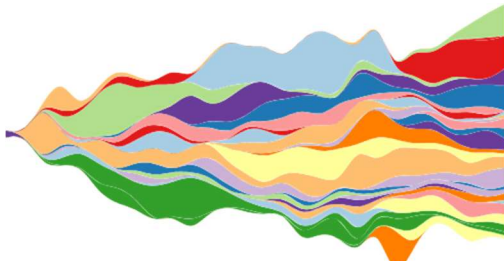
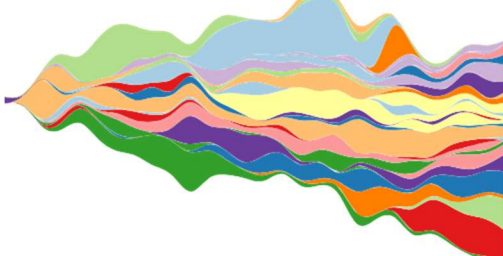
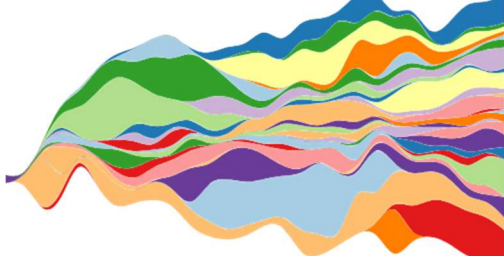
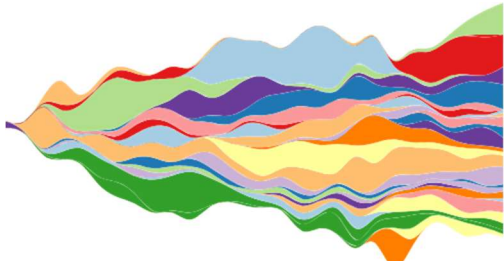
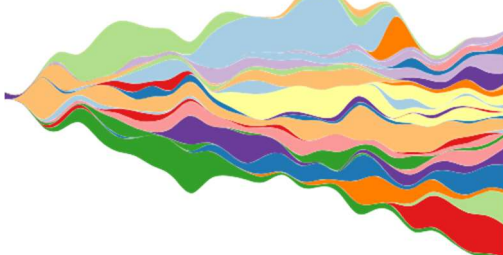
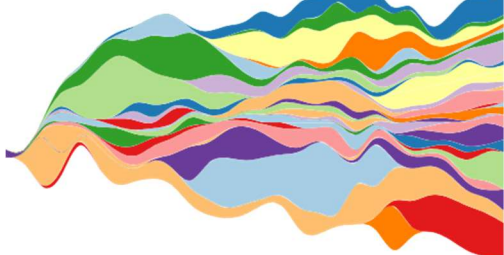
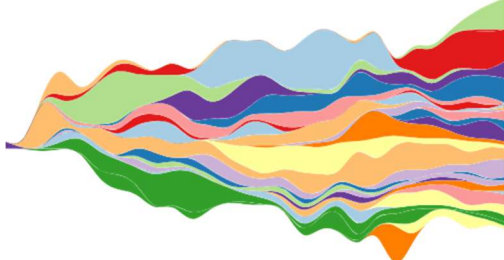
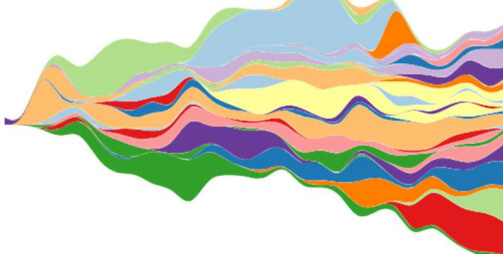
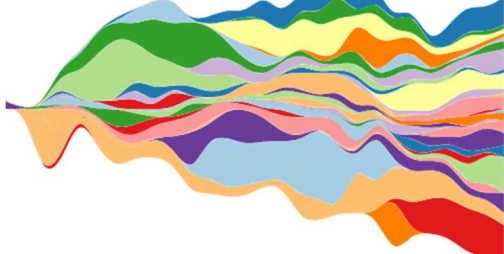
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	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 2.11E22</p>	 <p>Wiggle_{norm2} : 2.72E22</p>	 <p>Wiggle_{norm2} : 2.74E21</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 3.78E15</p>	 <p>Wiggle_{norm1} : 4.09E15</p>	 <p>Wiggle_{norm1} : 3.73E15</p>
intellectual property 2 Layers: 10 Length: 44		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <p>Sine Illusion : 1.36E24</p>	 <p>Sine Illusion : 2.44E25</p>	 <p>Sine Illusion : 2.22E24</p>
	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 5.13E25</p>	 <p>Wiggle_{norm2} : 9.29E25</p>	 <p>Wiggle_{norm2} : 2.22E24</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 6.86E17</p>	 <p>Wiggle_{norm1} : 8.43E17</p>	 <p>Wiggle_{norm1} : 6.72E17</p>

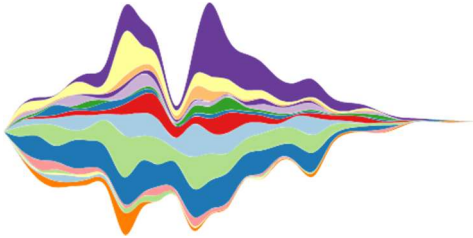
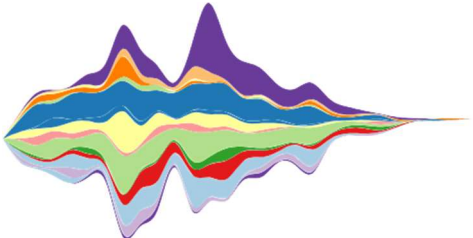
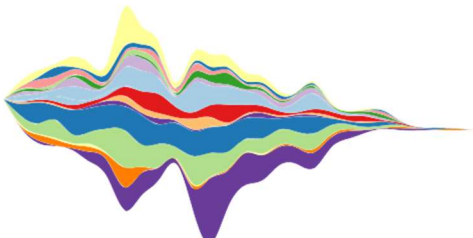
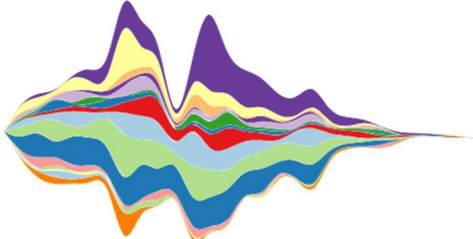
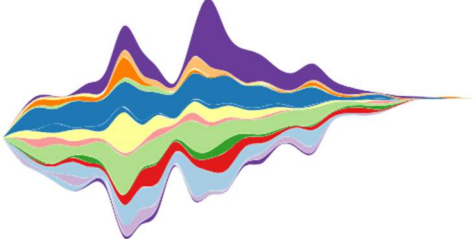
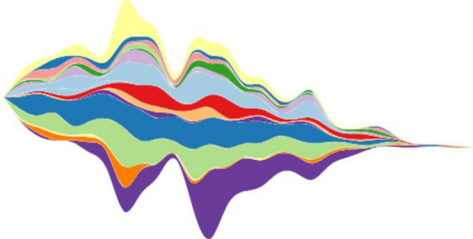
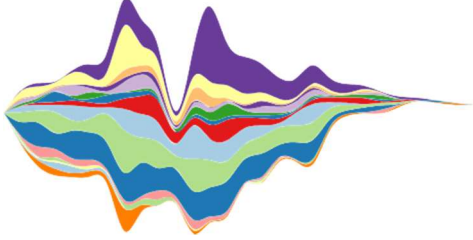
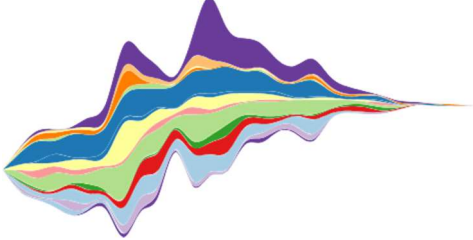
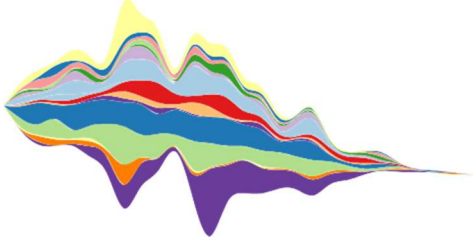
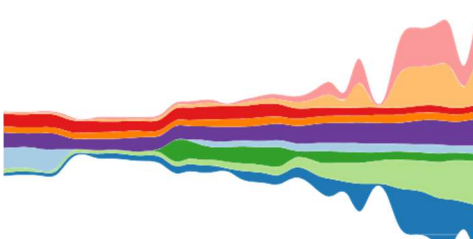
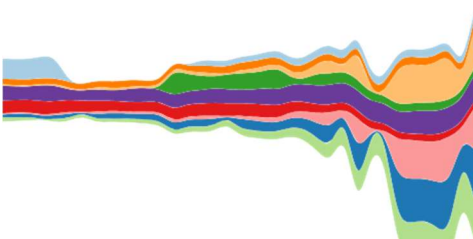
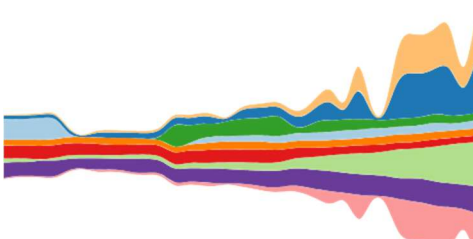
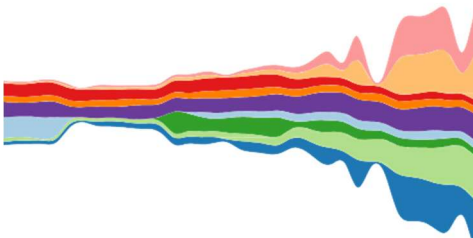
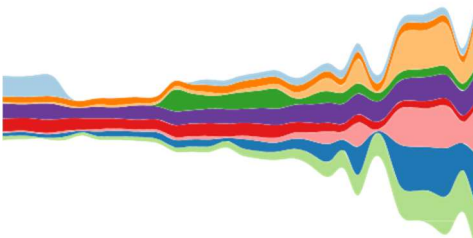
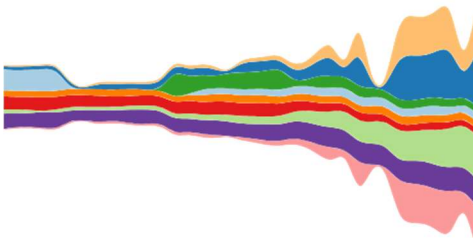
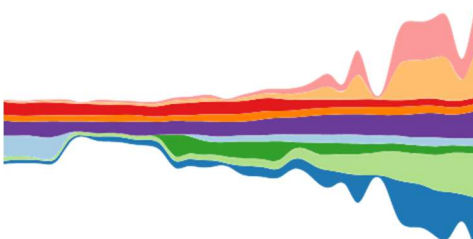
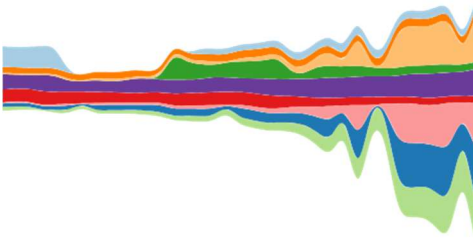
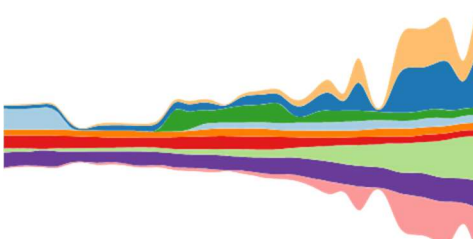
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	Sine_Illusion	 <div>Sine Illusion : 4.35E7</div>	 <div>Sine Illusion : 1.16E8</div>	 <div>Sine Illusion : 2.99E7</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 3.68E8</div>	 <div>Wiggle_{norm2} : 5.33E8</div>	 <div>Wiggle_{norm2} : 2.99E7</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 3.34E6</div>	 <div>Wiggle_{norm1} : 3.90E6</div>	 <div>Wiggle_{norm1} : 3.21E6</div>
<div>debt 2</div> <div>Layers: 10</div> <div>Length: 49</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 9.32E5</div>	 <div>Sine Illusion : 1.20E7</div>	 <div>Sine Illusion : 1.54E6</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 7.11E7</div>	 <div>Wiggle_{norm2} : 8.30E7</div>	 <div>Wiggle_{norm2} : 1.54E6</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 1.07E6</div>	 <div>Wiggle_{norm1} : 1.12E6</div>	 <div>Wiggle_{norm1} : 1.08E6</div>

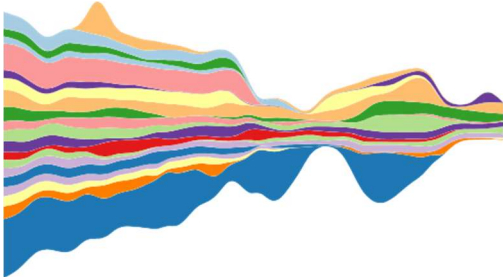
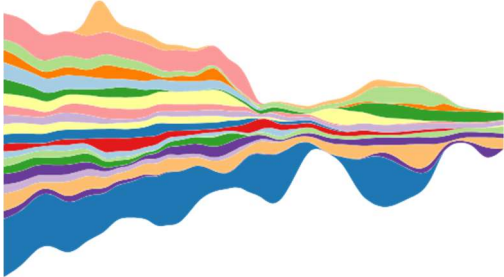
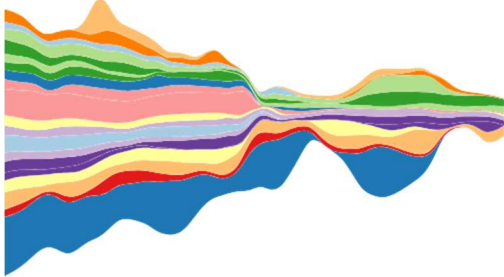
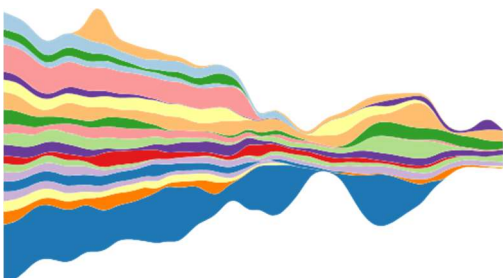
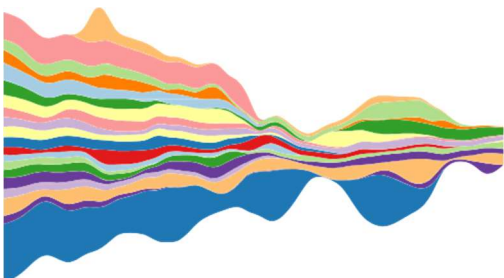
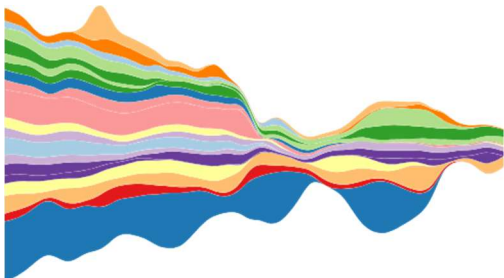
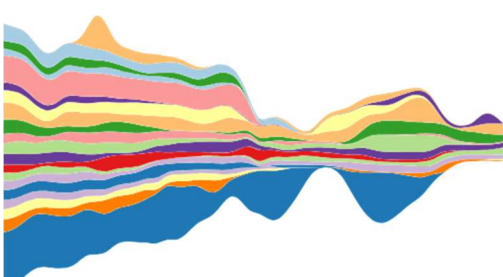
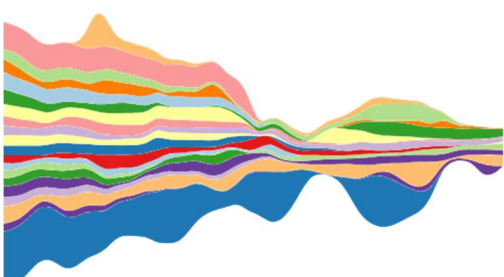
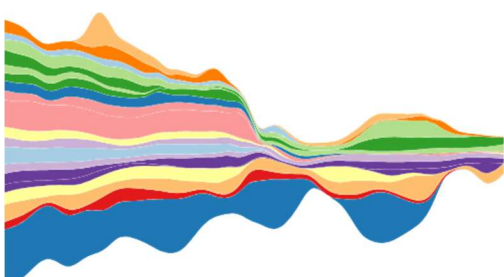
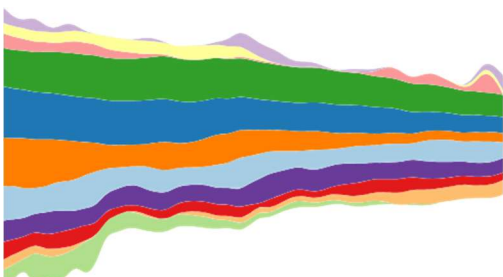
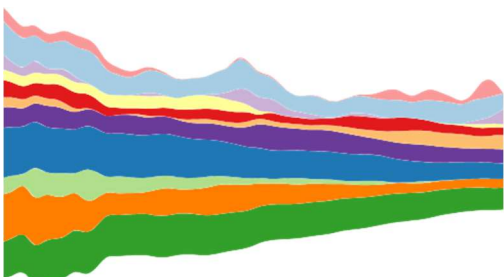
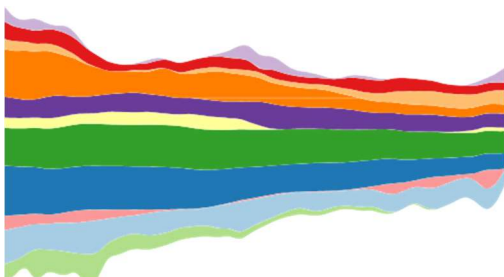
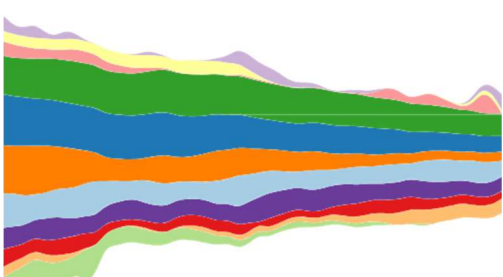
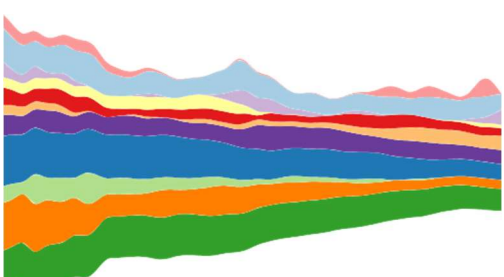
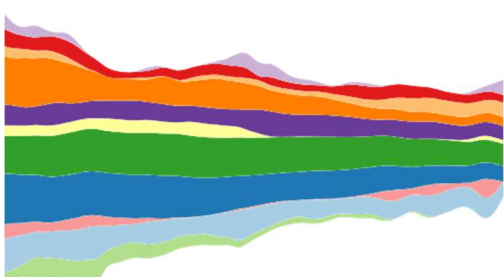
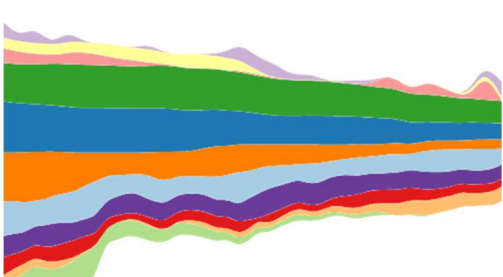
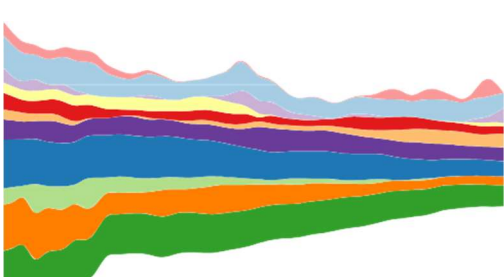
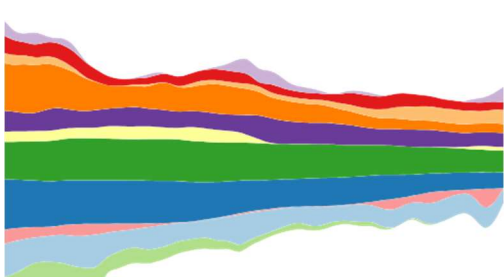
data		Layout		
<div>debt</div> <div>3</div> <div>Layers: 10</div> <div>Length: 49</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 2.45E6</div>	 <div>Sine Illusion : 2.81E7</div>	 <div>Sine Illusion : 1.90E6</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 1.09E8</div>	 <div>Wiggle_{norm2} : 1.42E8</div>	 <div>Wiggle_{norm2} : 1.90E6</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 1.33E6</div>	 <div>Wiggle_{norm1} : 1.48E6</div>	 <div>Wiggle_{norm1} : 1.33E6</div>
<div>gdp</div> <div>2nd</div> <div>Layers: 31</div> <div>Length: 19</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 1.21E1</div>	 <div>Sine Illusion : 1.84E1</div>	 <div>Sine Illusion : 1.07E1</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 2.52E1</div>	 <div>Wiggle_{norm2} : 3.16E1</div>	 <div>Wiggle_{norm2} : 1.07E1</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 2.65E1</div>	 <div>Wiggle_{norm1} : 2.86E1</div>	 <div>Wiggle_{norm1} : 2.50E1</div>

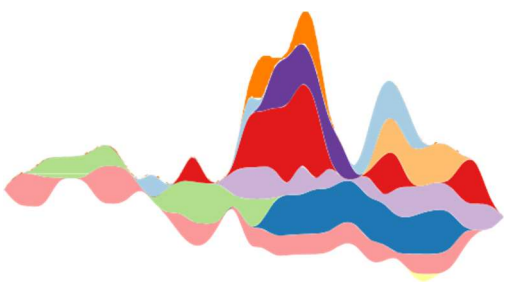
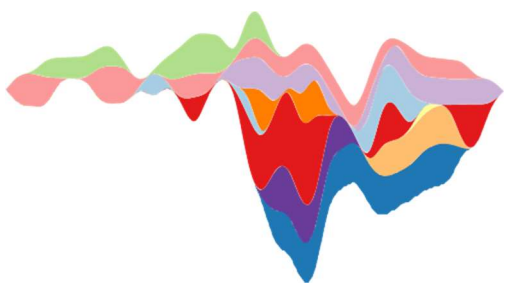
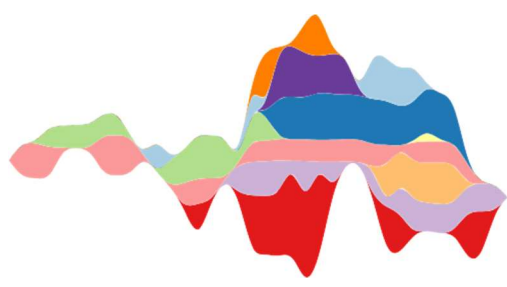
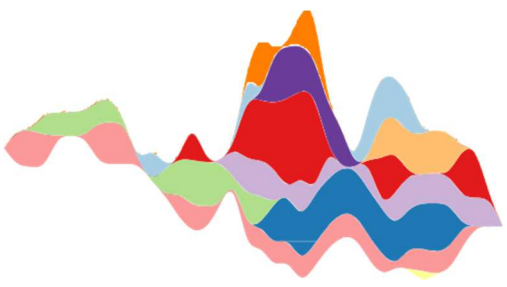
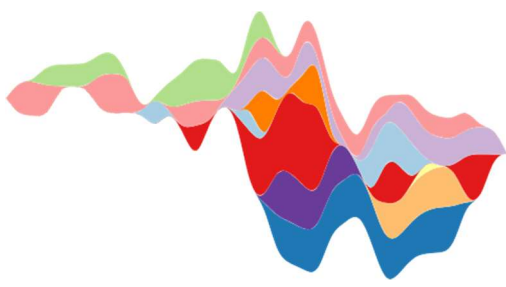
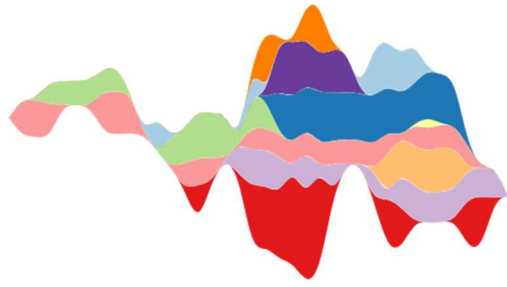
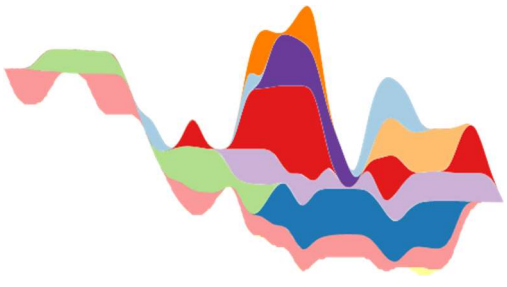
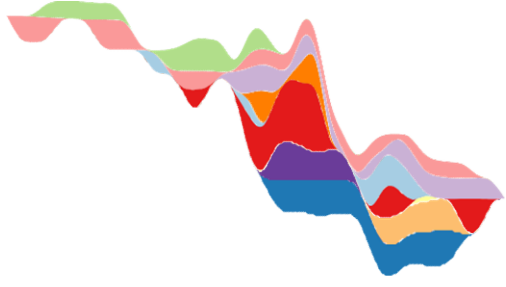
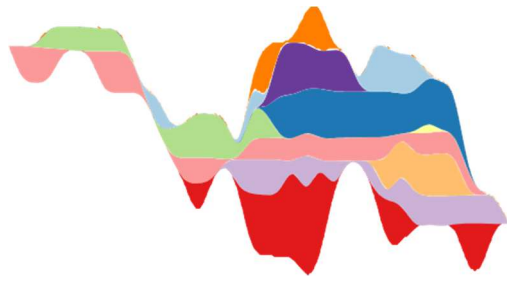
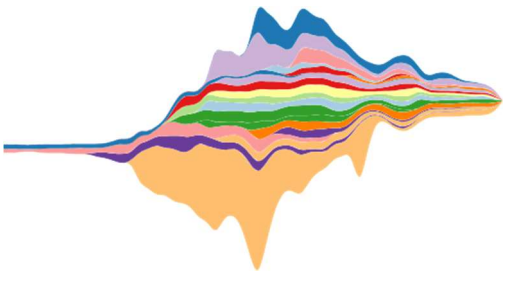
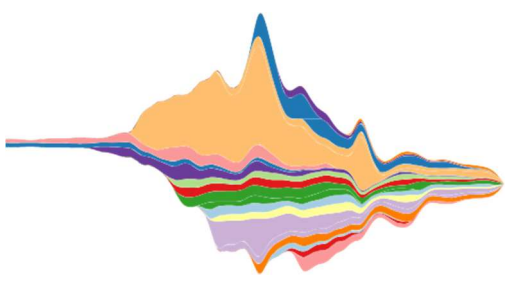
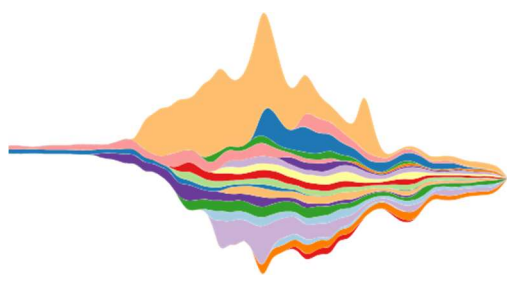
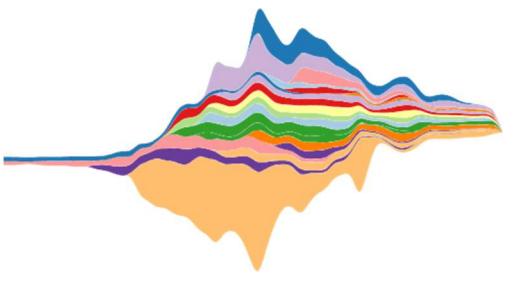
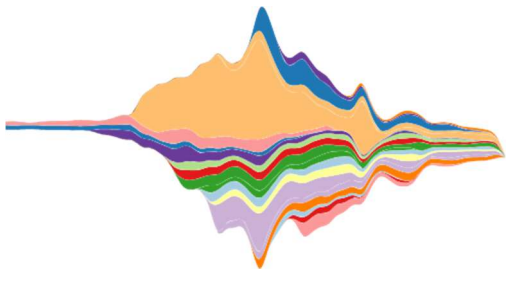
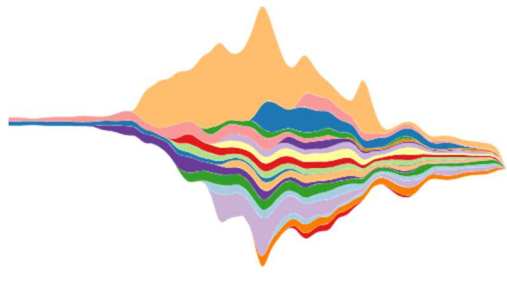
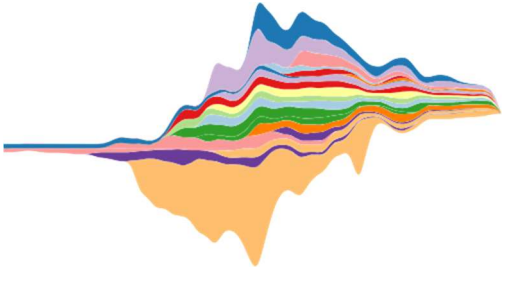
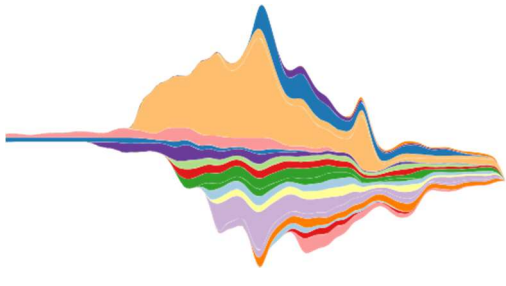
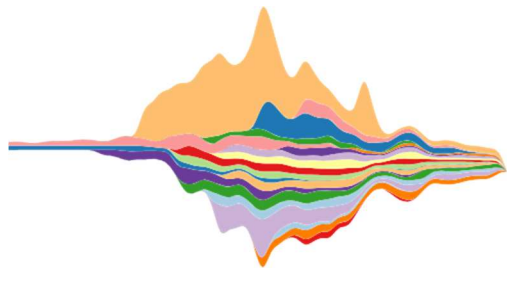
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gdp 3rd Layers: 31 Length: 19		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <p>Sine Illusion : 2.60E0</p>	 <p>Sine Illusion : 3.48E0</p>	 <p>Sine Illusion : 2.54E0</p>
	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 5.97E0</p>	 <p>Wiggle_{norm2} : 6.39E0</p>	 <p>Wiggle_{norm2} : 2.54E0</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 1.43E1</p>	 <p>Wiggle_{norm1} : 1.59E1</p>	 <p>Wiggle_{norm1} : 1.42E1</p>
insurance and financial services Layers: 9 Length: 265		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <p>Sine Illusion : 1.79E2</p>	 <p>Sine Illusion : 2.70E2</p>	 <p>Sine Illusion : 1.92E2</p>
	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 5.09E2</p>	 <p>Wiggle_{norm2} : 5.40E2</p>	 <p>Wiggle_{norm2} : 1.92E2</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 1.18E3</p>	 <p>Wiggle_{norm1} : 1.20E3</p>	 <p>Wiggle_{norm1} : 1.18E3</p>

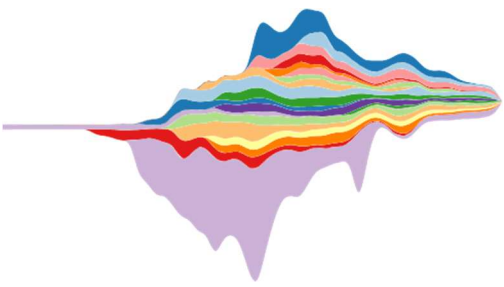
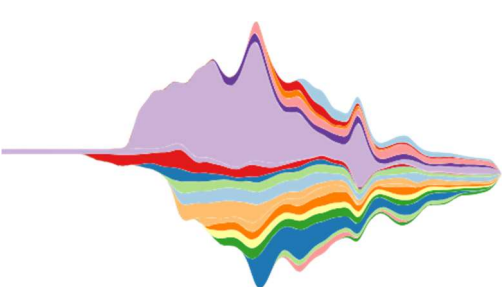
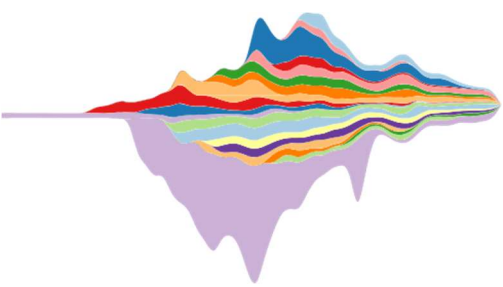
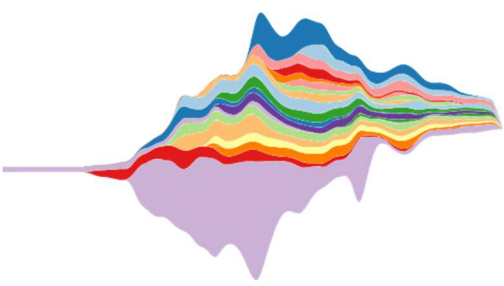
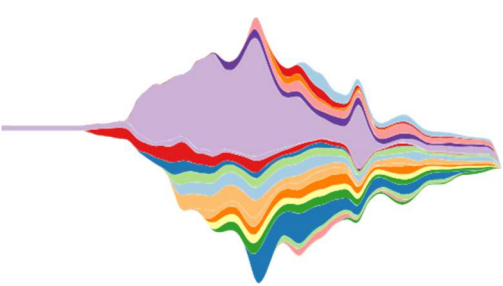
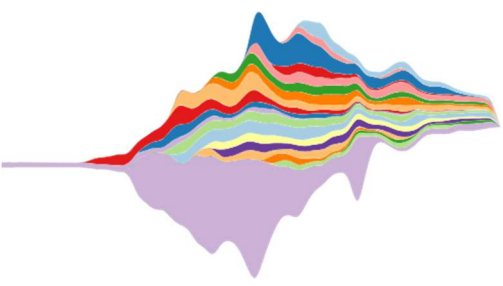
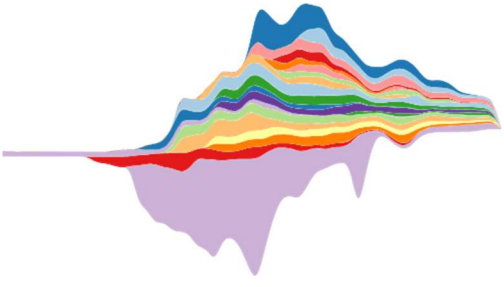
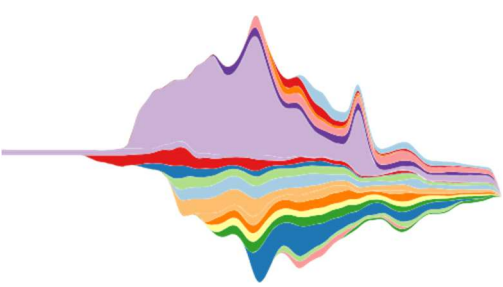
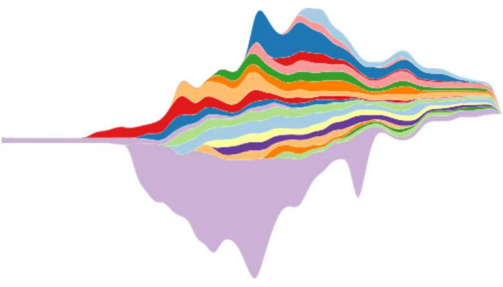
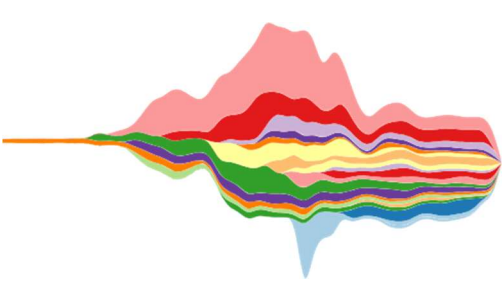
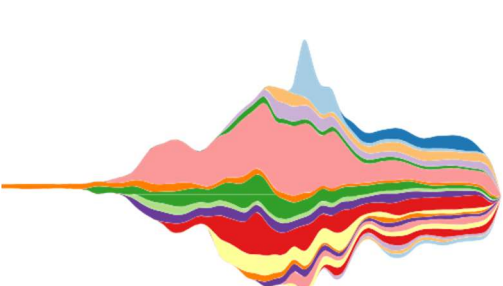
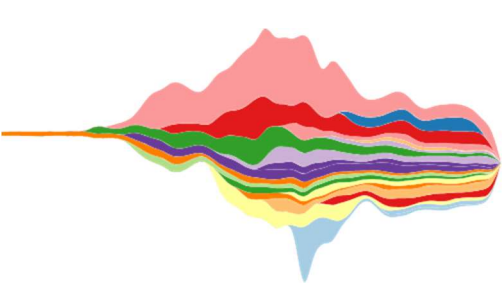
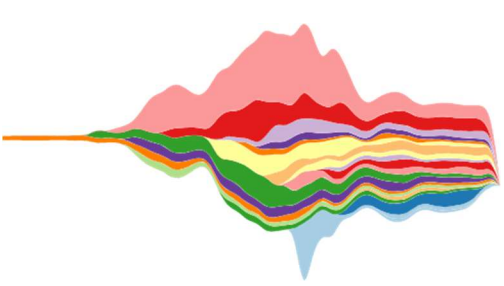
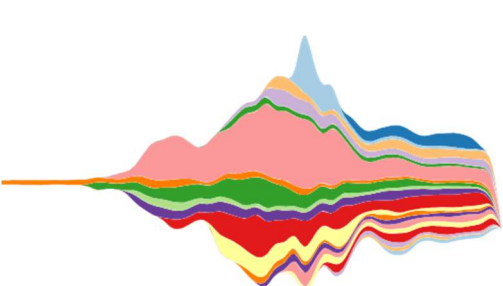
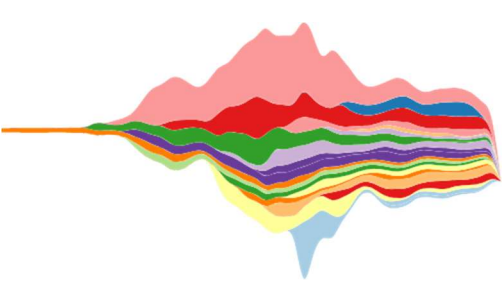
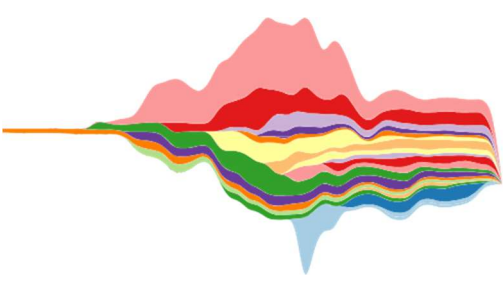
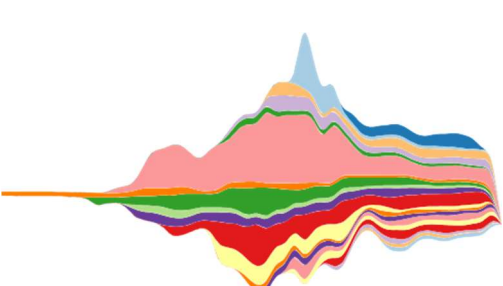
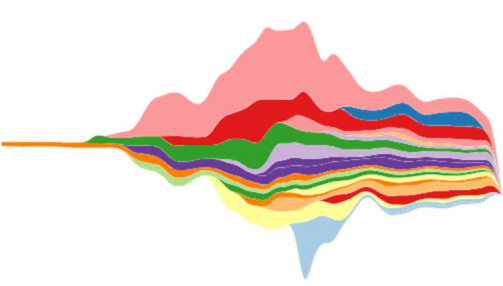
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	Sine_Illusion	 <div>Sine Illusion : 1.55E3</div>	 <div>Sine Illusion : 1.58E3</div>	 <div>Sine Illusion : 1.68E3</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 1.59E3</div>	 <div>Wiggle_{norm2} : 1.73E3</div>	 <div>Wiggle_{norm2} : 1.68E3</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 6.75E2</div>	 <div>Wiggle_{norm1} : 6.86E2</div>	 <div>Wiggle_{norm1} : 7.00E2</div>
<div>oly fencing</div> <div>Layers: 20</div> <div>Length: 28</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 3.55E4</div>	 <div>Sine Illusion : 4.06E4</div>	 <div>Sine Illusion : 3.34E4</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 4.02E4</div>	 <div>Wiggle_{norm2} : 4.86E4</div>	 <div>Wiggle_{norm2} : 3.34E4</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 7.03E3</div>	 <div>Wiggle_{norm1} : 7.96E3</div>	 <div>Wiggle_{norm1} : 7.86E3</div>

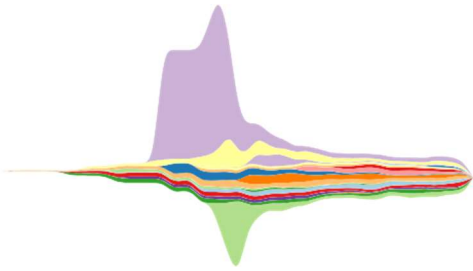
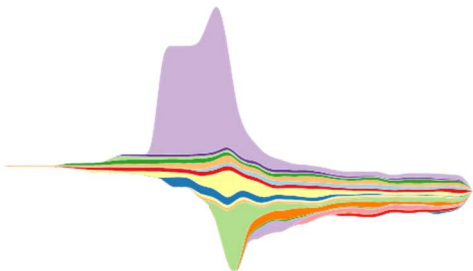
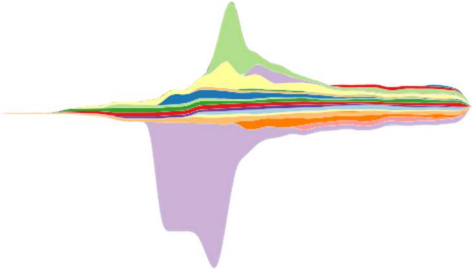
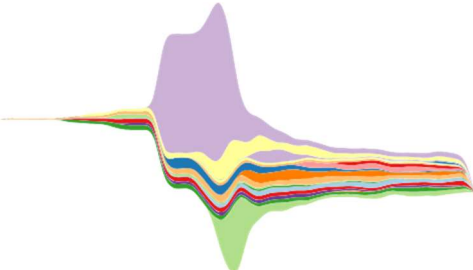
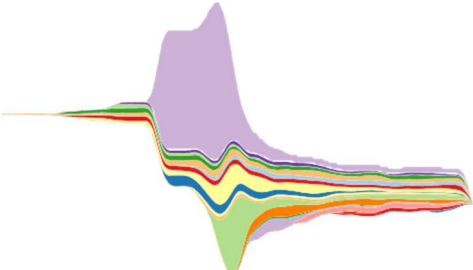
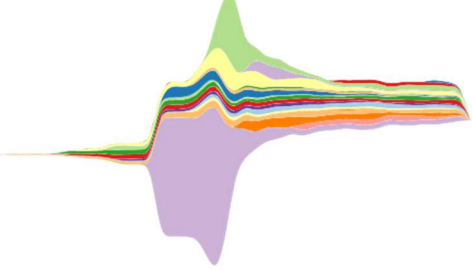
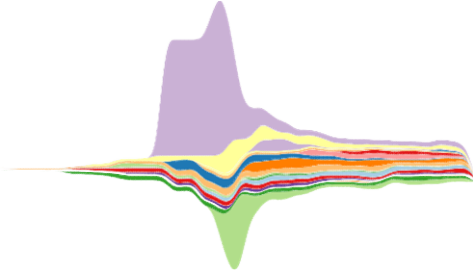
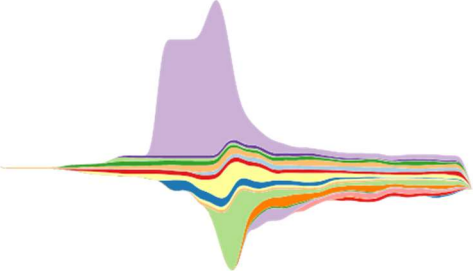
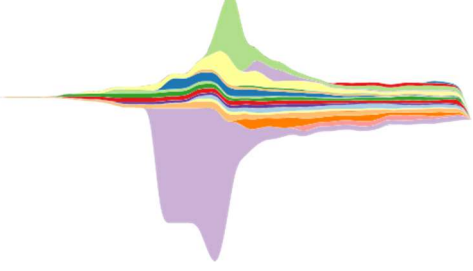
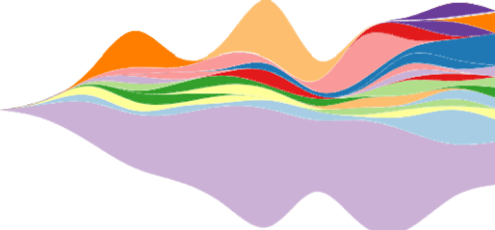
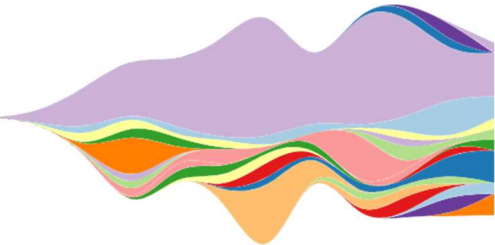
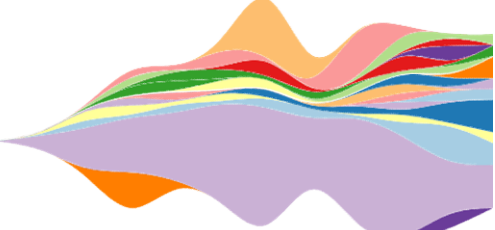
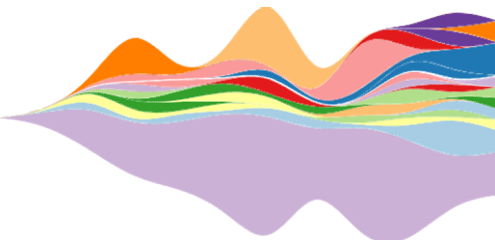
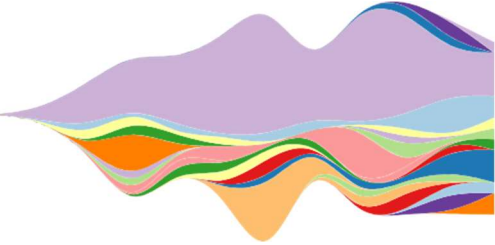
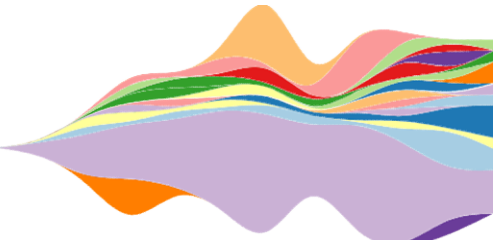
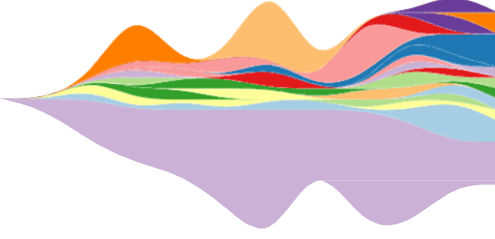
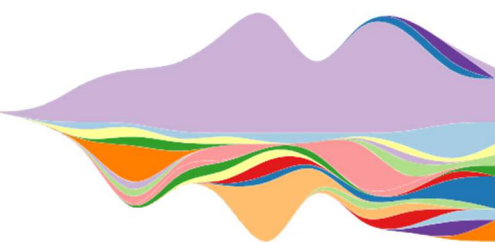
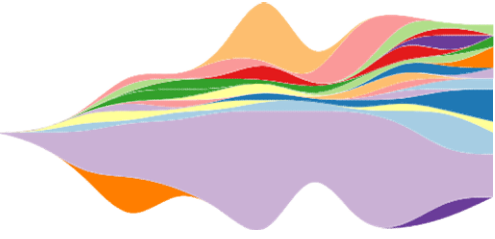
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oly shooting Layers: 26 Length: 28		Ours	LateOnset	TwoOpt
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	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 1.69E5</p>	 <p>Wiggle_{norm2} : 2.89E5</p>	 <p>Wiggle_{norm2} : 1.75E5</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 9.26E3</p>	 <p>Wiggle_{norm1} : 1.18E4</p>	 <p>Wiggle_{norm1} : 9.26E3</p>
oly wrestling Layers: 35 Length: 28		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <p>Sine Illusion : 7.07E3</p>	 <p>Sine Illusion : 8.91E3</p>	 <p>Sine Illusion : 7.62E3</p>
	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 1.23E4</p>	 <p>Wiggle_{norm2} : 1.57E4</p>	 <p>Wiggle_{norm2} : 7.62E3</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 3.44E3</p>	 <p>Wiggle_{norm1} : 3.73E3</p>	 <p>Wiggle_{norm1} : 3.51E3</p>

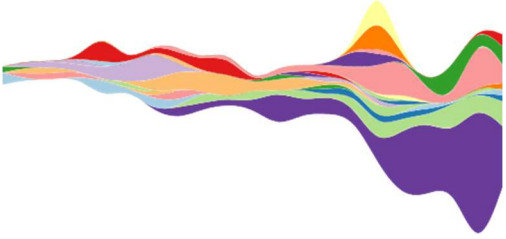
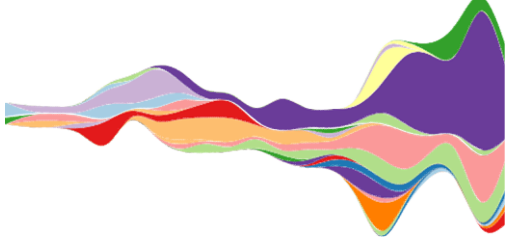
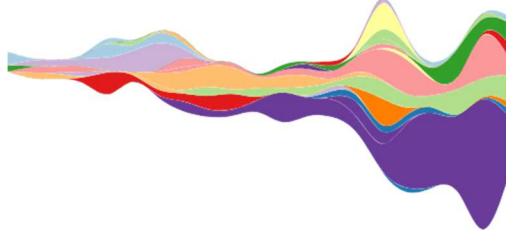
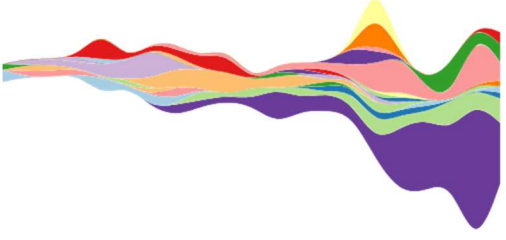
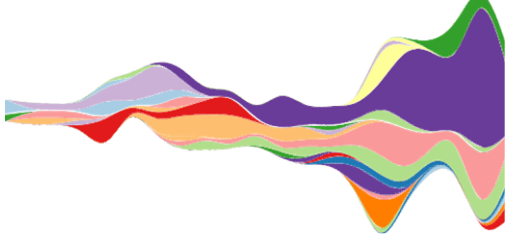
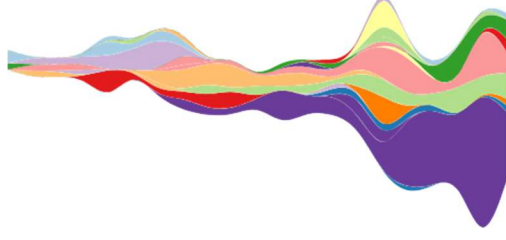
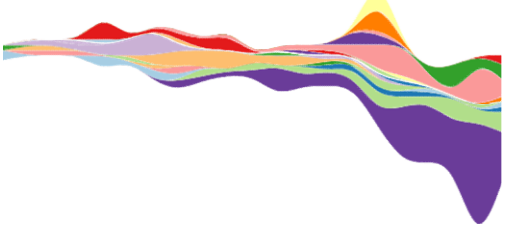
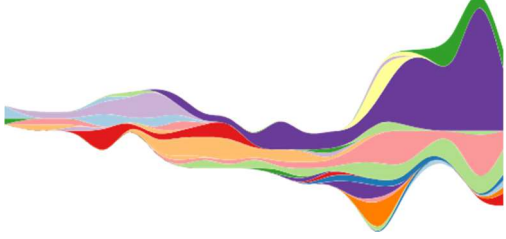

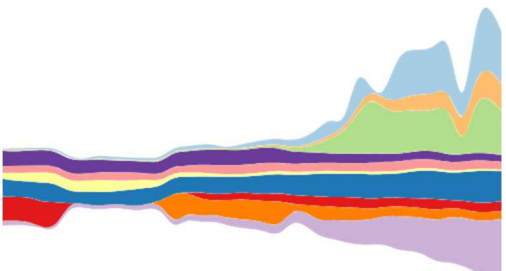
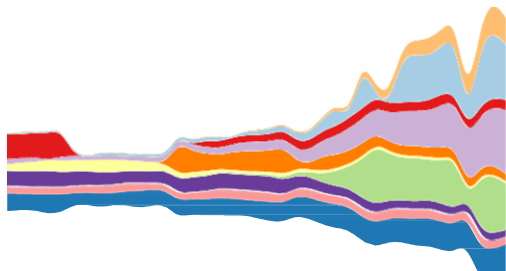
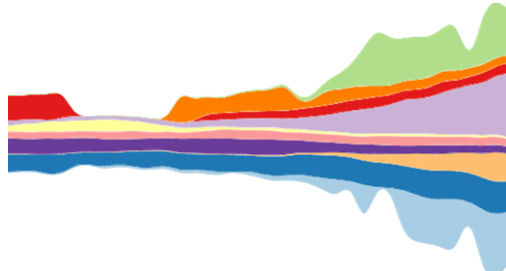
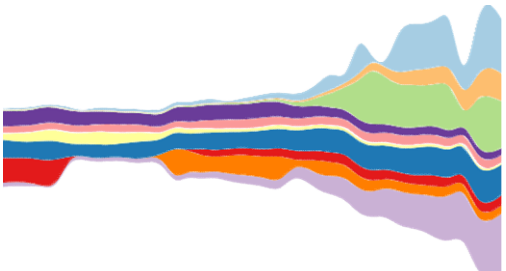
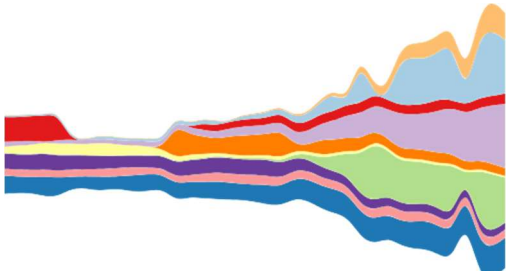
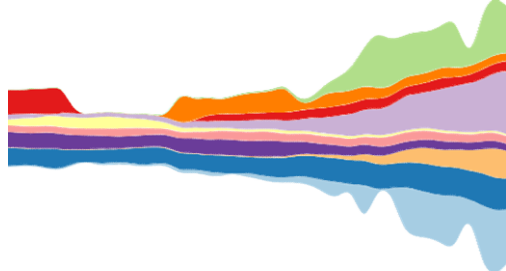
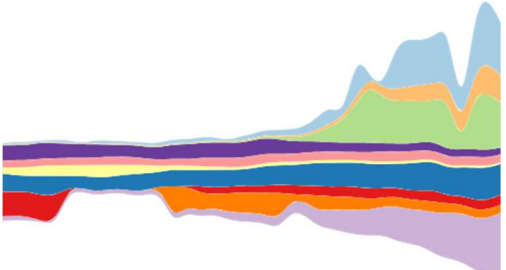
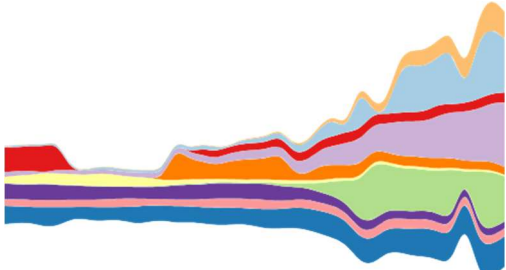
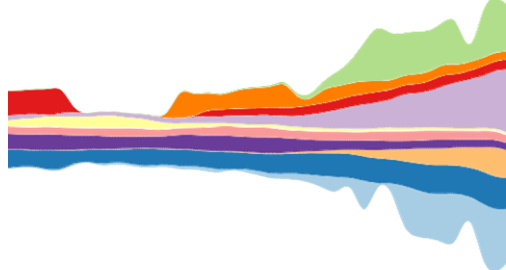
data		Layout		
<div> <div>outbreak anhui</div> <div>Layers: 16</div> <div>Length: 30</div> </div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 7.42E3</div>	 <div>Sine Illusion : 2.93E4</div>	 <div>Sine Illusion : 1.20E4</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 8.83E4</div>	 <div>Wiggle_{norm2} : 1.19E5</div>	 <div>Wiggle_{norm2} : 1.20E4</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 6.53E3</div>	 <div>Wiggle_{norm1} : 7.93E3</div>	 <div>Wiggle_{norm1} : 6.63E3</div>
<div> <div>patent application</div> <div>Layers: 9</div> <div>Length: 39</div> </div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 4.15E11</div>	 <div>Sine Illusion : 1.11E13</div>	 <div>Sine Illusion : 2.35E11</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 2.17E13</div>	 <div>Wiggle_{norm2} : 4.10E13</div>	 <div>Wiggle_{norm2} : 2.35E11</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 2.50E9</div>	 <div>Wiggle_{norm1} : 3.93E9</div>	 <div>Wiggle_{norm1} : 2.94E9</div>

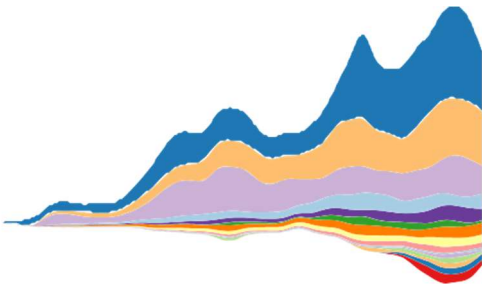
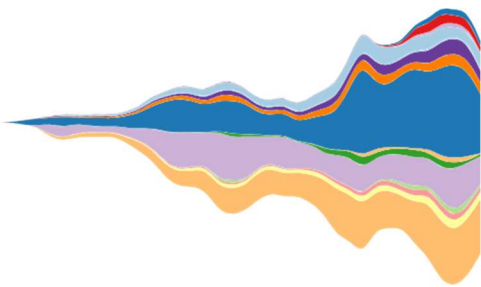
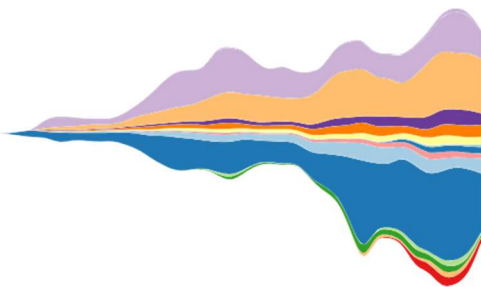
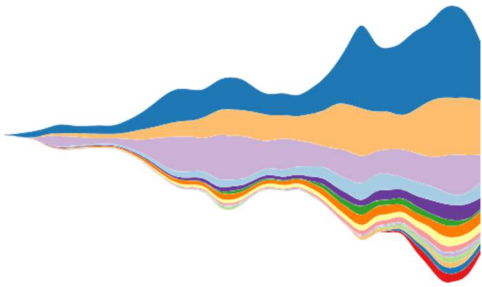
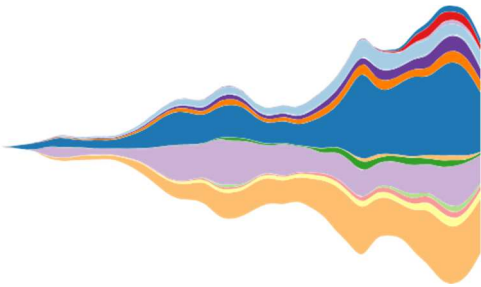
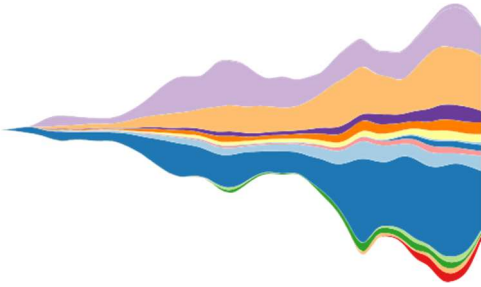
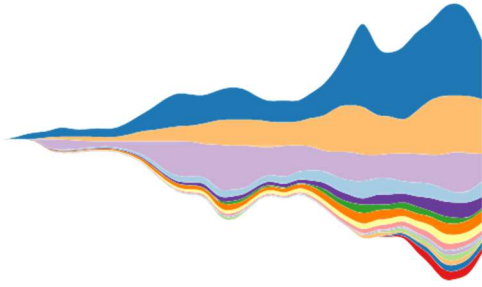
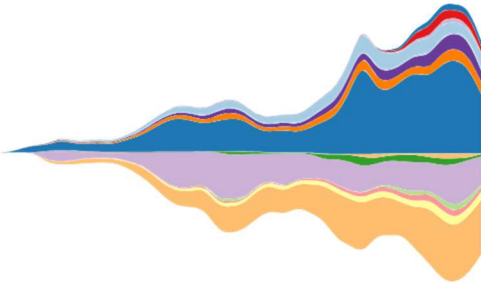
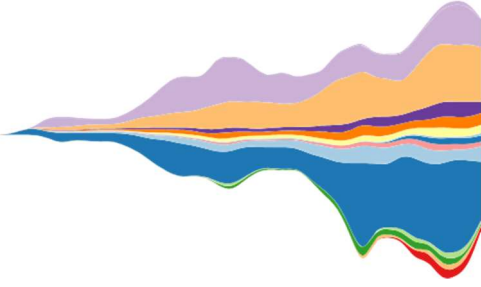
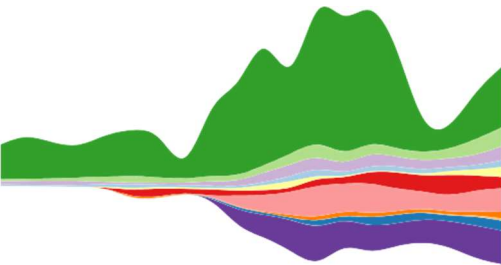
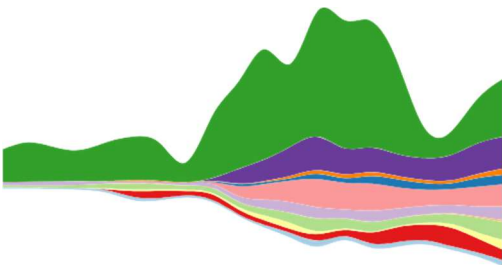
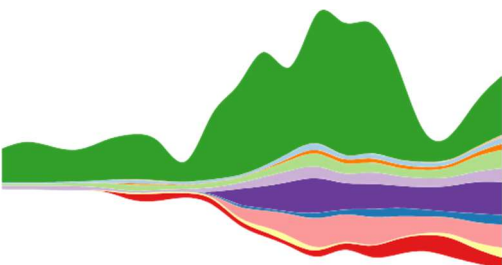
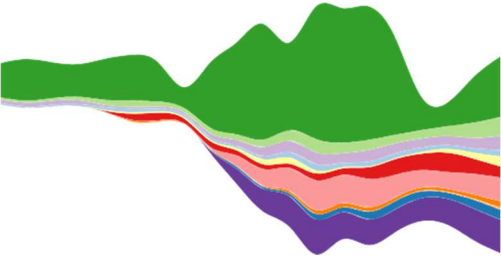
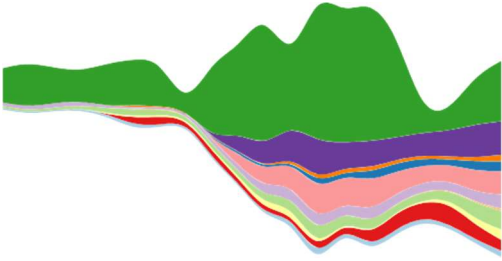
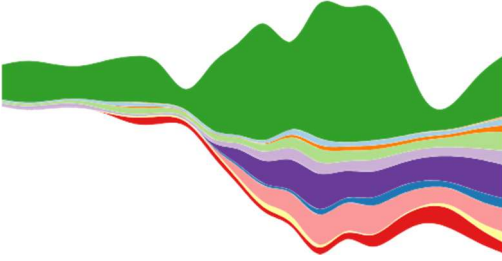
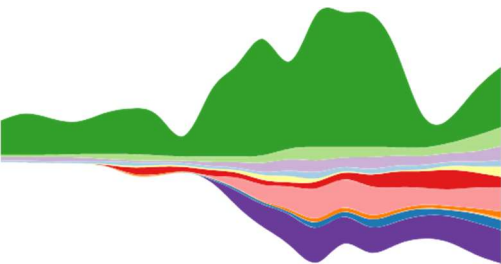
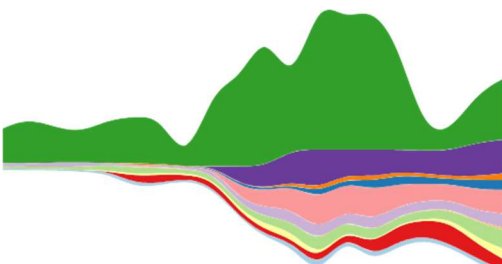
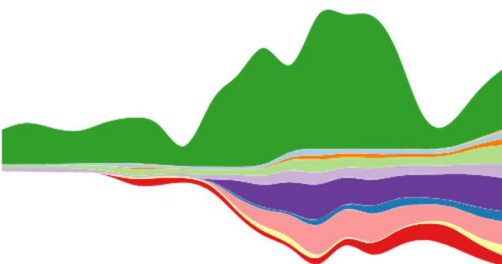
data		Layout		
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	Sine_Illusion	 <div>Sine Illusion : 2.33E1</div>	 <div>Sine Illusion : 3.03E1</div>	 <div>Sine Illusion : 1.91E1</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 8.83E1</div>	 <div>Wiggle_{norm2} : 1.11E2</div>	 <div>Wiggle_{norm2} : 1.91E1</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 1.93E2</div>	 <div>Wiggle_{norm1} : 2.10E2</div>	 <div>Wiggle_{norm1} : 1.85E2</div>
<div> <div>population 2</div> <div>Layers: 11</div> <div>Length: 50</div> </div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 5.06E0</div>	 <div>Sine Illusion : 1.49E1</div>	 <div>Sine Illusion : 2.60E0</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 1.45E1</div>	 <div>Wiggle_{norm2} : 2.55E1</div>	 <div>Wiggle_{norm2} : 2.60E0</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 5.25E1</div>	 <div>Wiggle_{norm1} : 7.19E1</div>	 <div>Wiggle_{norm1} : 3.87E1</div>

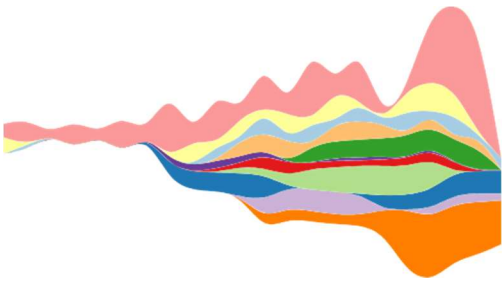
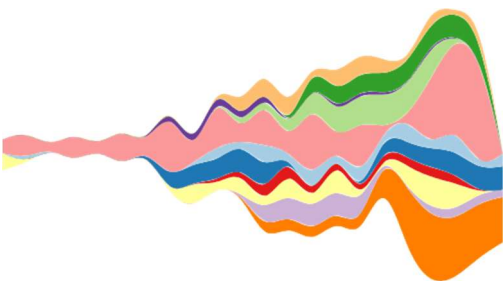
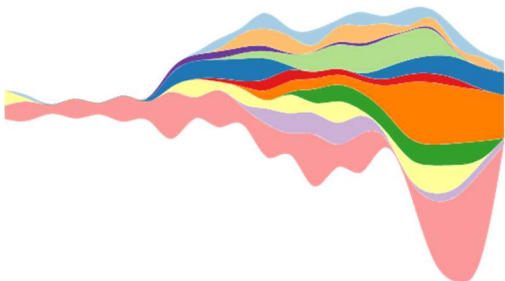
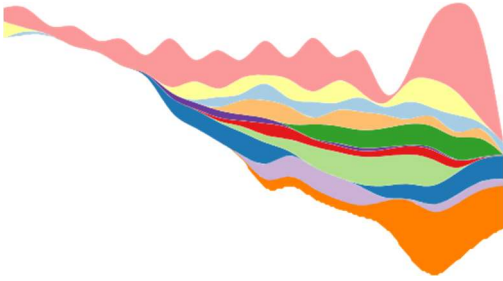
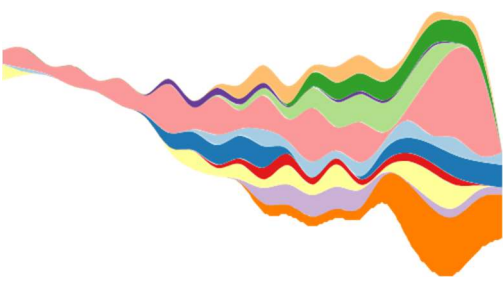
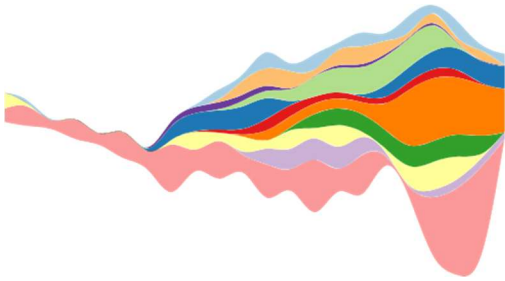
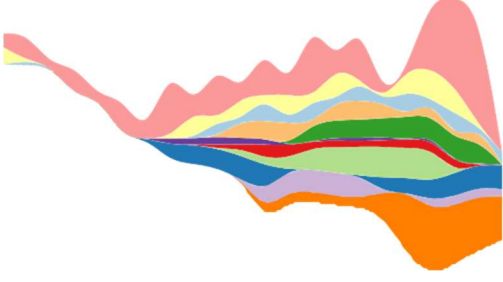
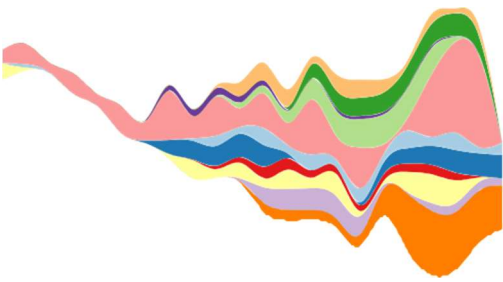
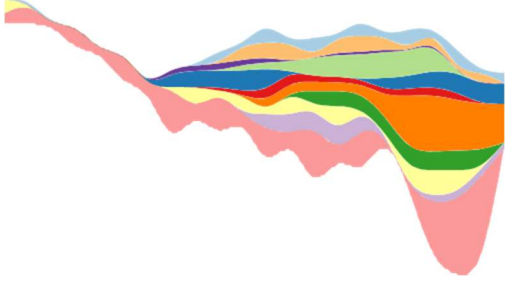
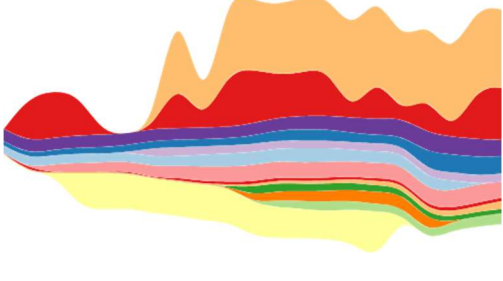
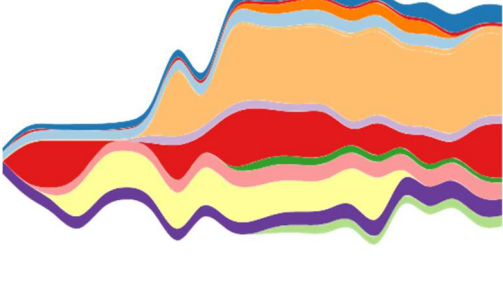
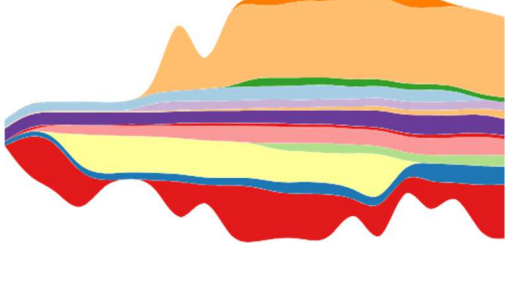
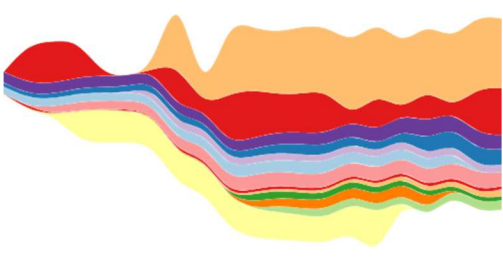
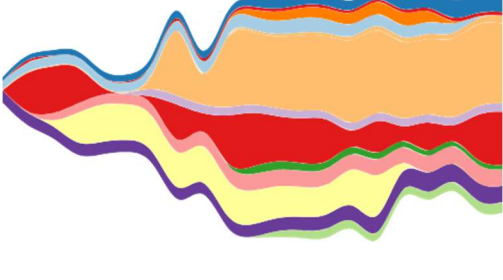
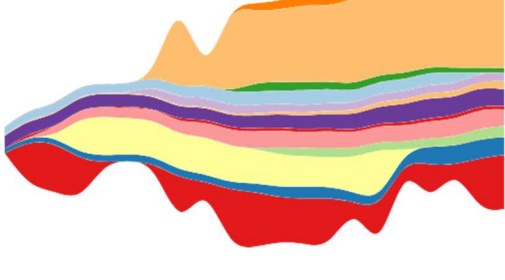
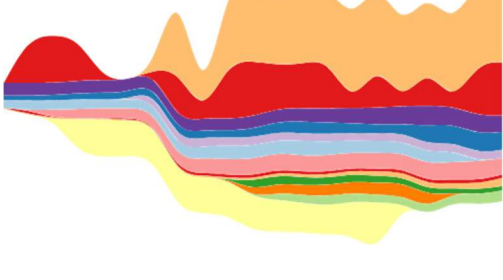
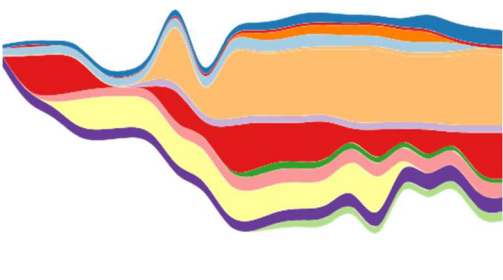
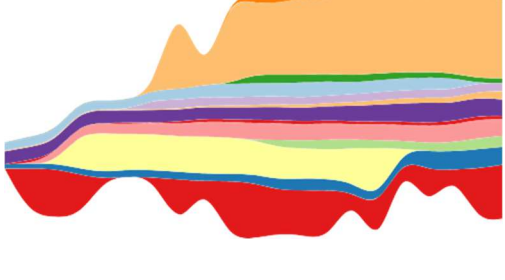
data		Layout		
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	Sine_Illusion	 <div>Sine Illusion : 1.07E4</div>	 <div>Sine Illusion : 1.98E4</div>	 <div>Sine Illusion : 1.16E4</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 7.09E4</div>	 <div>Wiggle_{norm2} : 1.33E5</div>	 <div>Wiggle_{norm2} : 1.16E4</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 8.02E3</div>	 <div>Wiggle_{norm1} : 1.09E4</div>	 <div>Wiggle_{norm1} : 8.83E3</div>
<div>rate 1</div> <div>Layers: 20</div> <div>Length: 60</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 2.85E4</div>	 <div>Sine Illusion : 6.78E4</div>	 <div>Sine Illusion : 3.96E4</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 2.56E5</div>	 <div>Wiggle_{norm2} : 2.75E5</div>	 <div>Wiggle_{norm2} : 3.96E4</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 2.44E4</div>	 <div>Wiggle_{norm1} : 2.70E4</div>	 <div>Wiggle_{norm1} : 2.48E4</div>

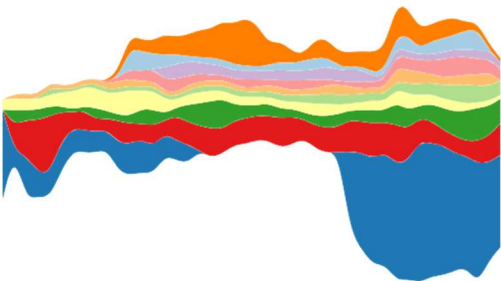
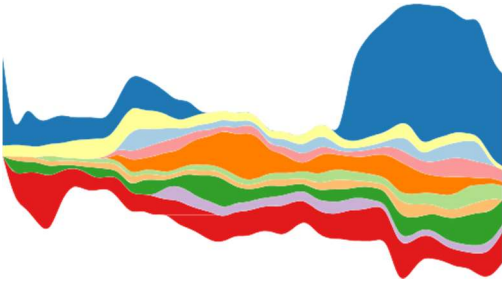
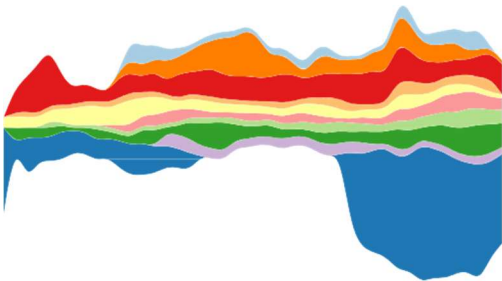
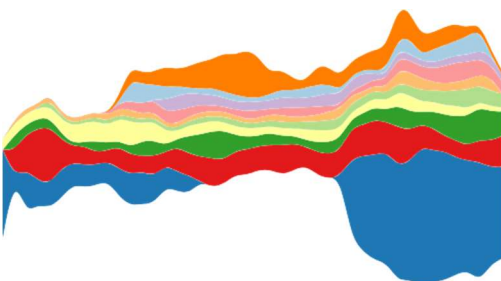
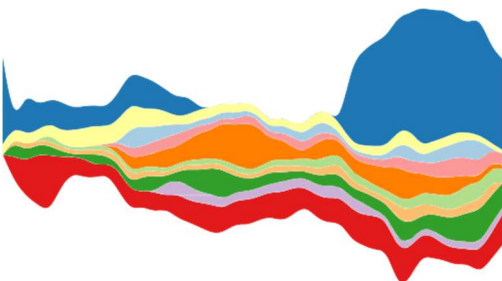
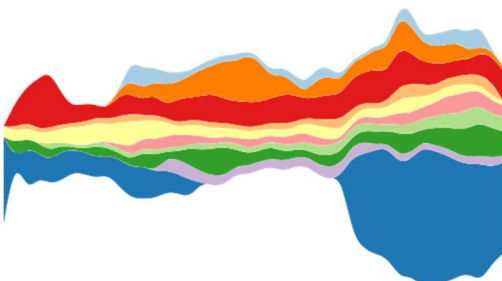
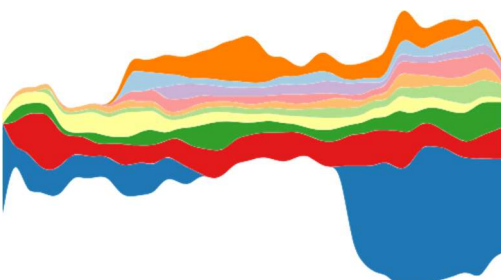
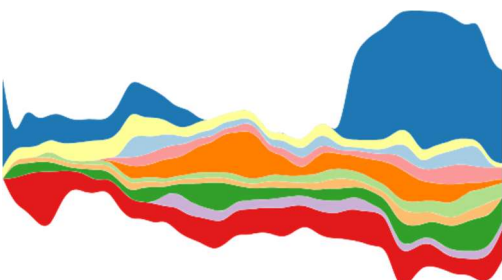
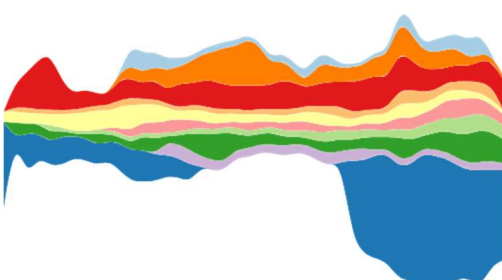
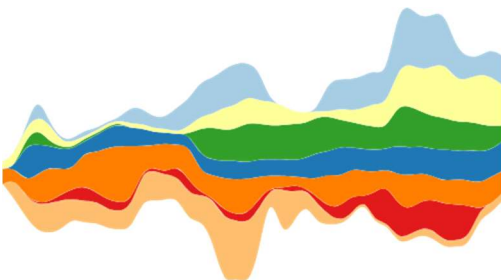
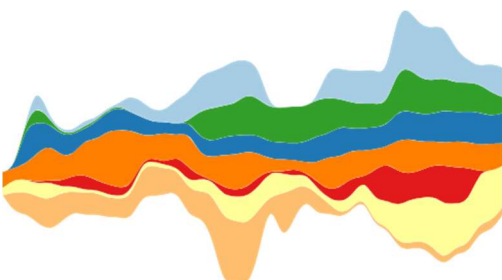
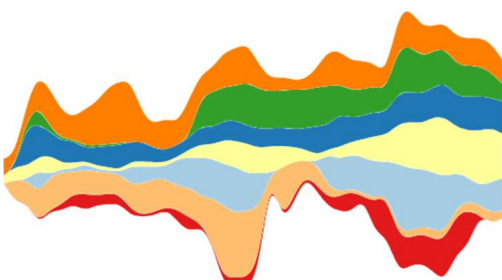
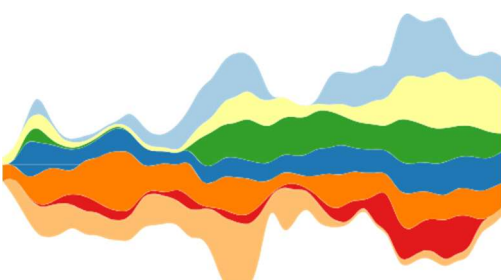
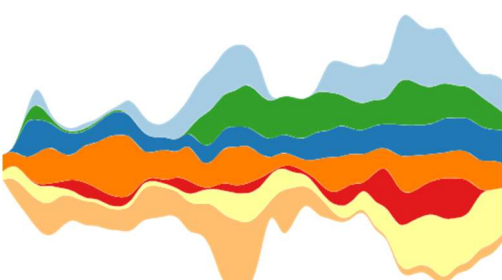
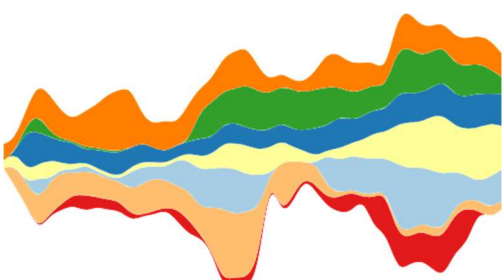
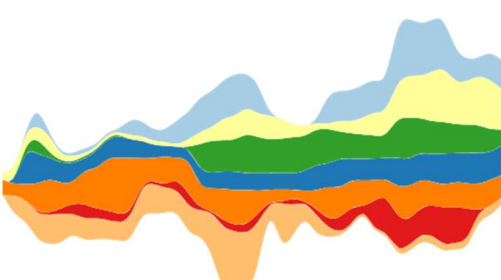
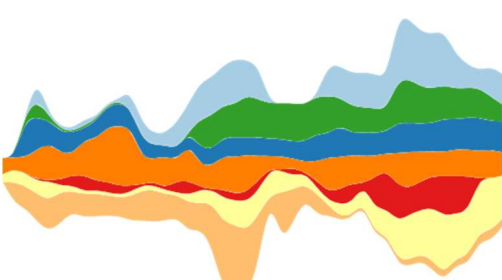
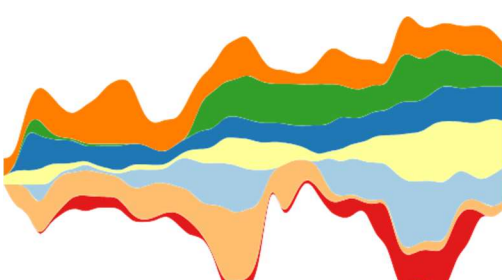
data		Layout		
<div>rate 2</div> <div>Layers: 20</div> <div>Length: 60</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <p>Sine Illusion : 3.21E4</p>	 <p>Sine Illusion : 4.61E4</p>	 <p>Sine Illusion : 3.41E4</p>
	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 1.22E5</p>	 <p>Wiggle_{norm2} : 1.69E5</p>	 <p>Wiggle_{norm2} : 3.41E4</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 1.81E4</p>	 <p>Wiggle_{norm1} : 2.10E4</p>	 <p>Wiggle_{norm1} : 2.00E4</p>
<div>rate 3</div> <div>Layers: 20</div> <div>Length: 54</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <p>Sine Illusion : 9.38E4</p>	 <p>Sine Illusion : 1.29E5</p>	 <p>Sine Illusion : 1.10E5</p>
	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 4.70E5</p>	 <p>Wiggle_{norm2} : 5.09E5</p>	 <p>Wiggle_{norm2} : 1.10E5</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 3.41E4</p>	 <p>Wiggle_{norm1} : 3.80E4</p>	 <p>Wiggle_{norm1} : 3.60E4</p>

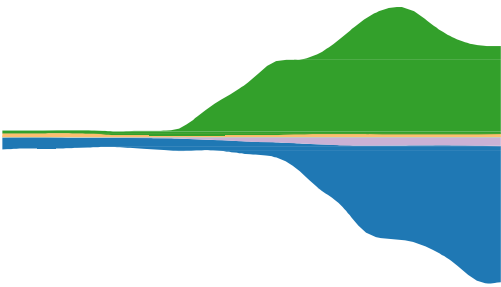
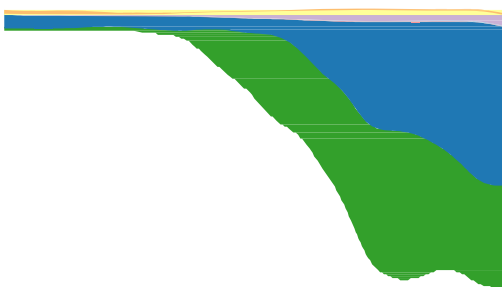
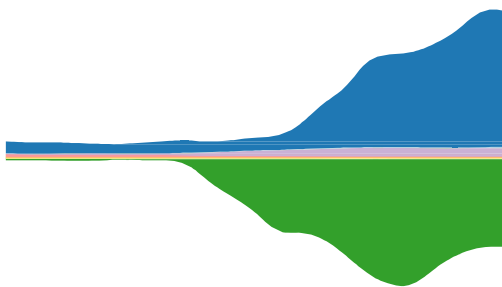
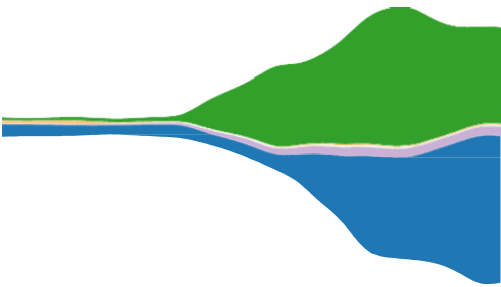
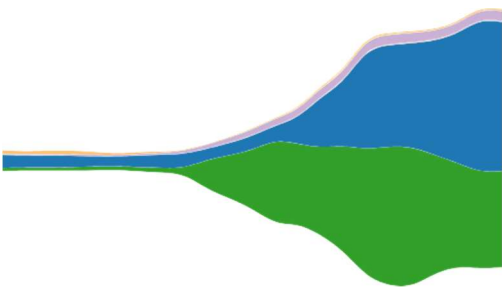
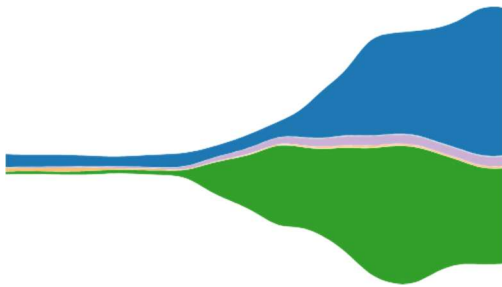

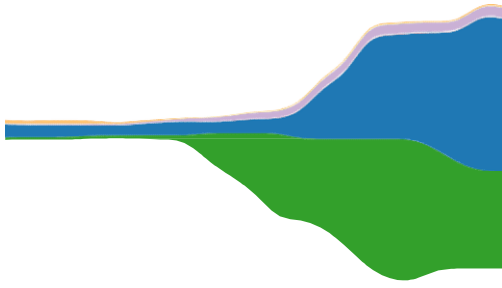
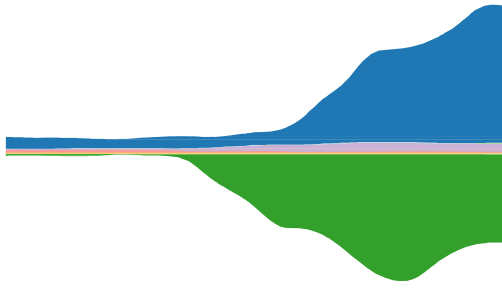
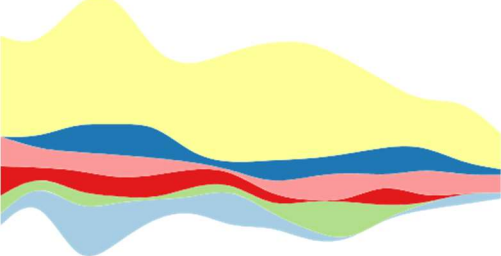
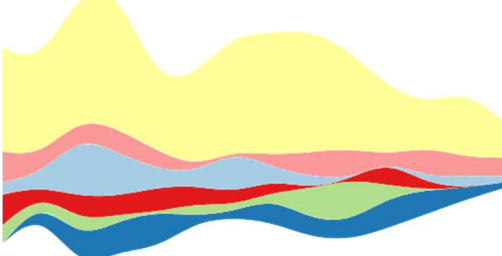
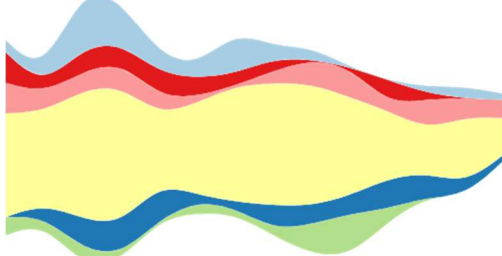
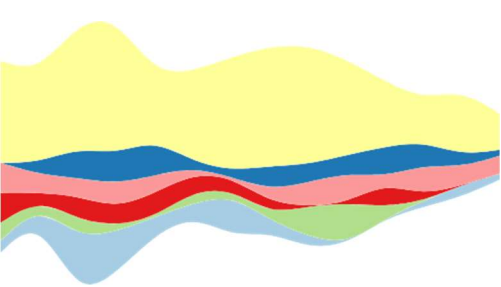
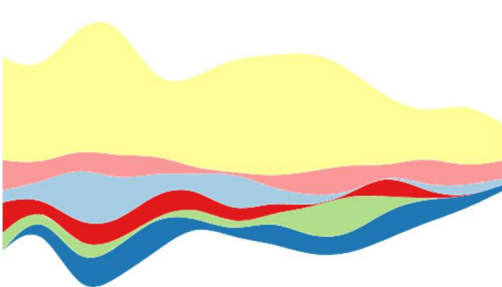
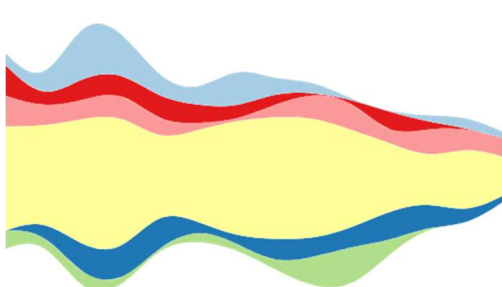
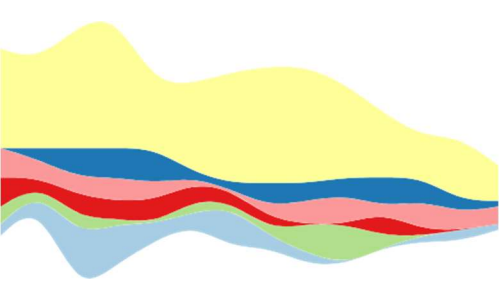
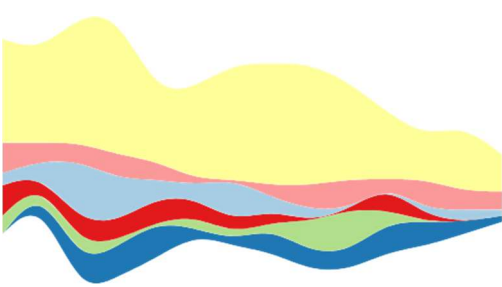
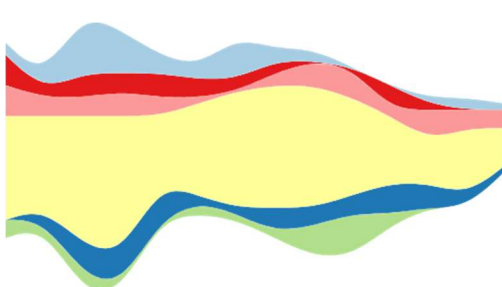
data		Layout		
<div>rate 4</div> <div>Layers: 20</div> <div>Length: 54</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 2.29E6</div>	 <div>Sine Illusion : 2.29E6</div>	 <div>Sine Illusion : 2.29E6</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 3.82E6</div>	 <div>Wiggle_{norm2} : 4.43E6</div>	 <div>Wiggle_{norm2} : 2.29E6</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 1.54E5</div>	 <div>Wiggle_{norm1} : 1.56E5</div>	 <div>Wiggle_{norm1} : 1.53E5</div>
<div>satellite contractor</div> <div>Layers: 23</div> <div>Length: 12</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 6.70E2</div>	 <div>Sine Illusion : 7.71E2</div>	 <div>Sine Illusion : 6.70E2</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 6.83E2</div>	 <div>Wiggle_{norm2} : 8.37E2</div>	 <div>Wiggle_{norm2} : 6.70E2</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 2.75E2</div>	 <div>Wiggle_{norm1} : 3.21E2</div>	 <div>Wiggle_{norm1} : 2.96E2</div>

data		Layout		
<div>satellite</div> <div>vechnicle</div> <div>Layers: 30</div> <div>Length: 21</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <p>Sine Illusion : 2.46E3</p>	 <p>Sine Illusion : 4.37E3</p>	 <p>Sine Illusion : 2.05E3</p>
	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 2.79E3</p>	 <p>Wiggle_{norm2} : 4.34E3</p>	 <p>Wiggle_{norm2} : 2.05E3</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 7.43E2</p>	 <p>Wiggle_{norm1} : 8.53E2</p>	 <p>Wiggle_{norm1} : 7.71E2</p>
<div>articles</div> <div>Layers: 11</div> <div>Length: 39</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <p>Sine Illusion : 2.90E11</p>	 <p>Sine Illusion : 3.44E12</p>	 <p>Sine Illusion : 7.55E10</p>
	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 4.65E12</p>	 <p>Wiggle_{norm2} : 1.30E13</p>	 <p>Wiggle_{norm2} : 7.55E10</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 1.77E9</p>	 <p>Wiggle_{norm1} : 2.14E9</p>	 <p>Wiggle_{norm1} : 1.42E9</p>

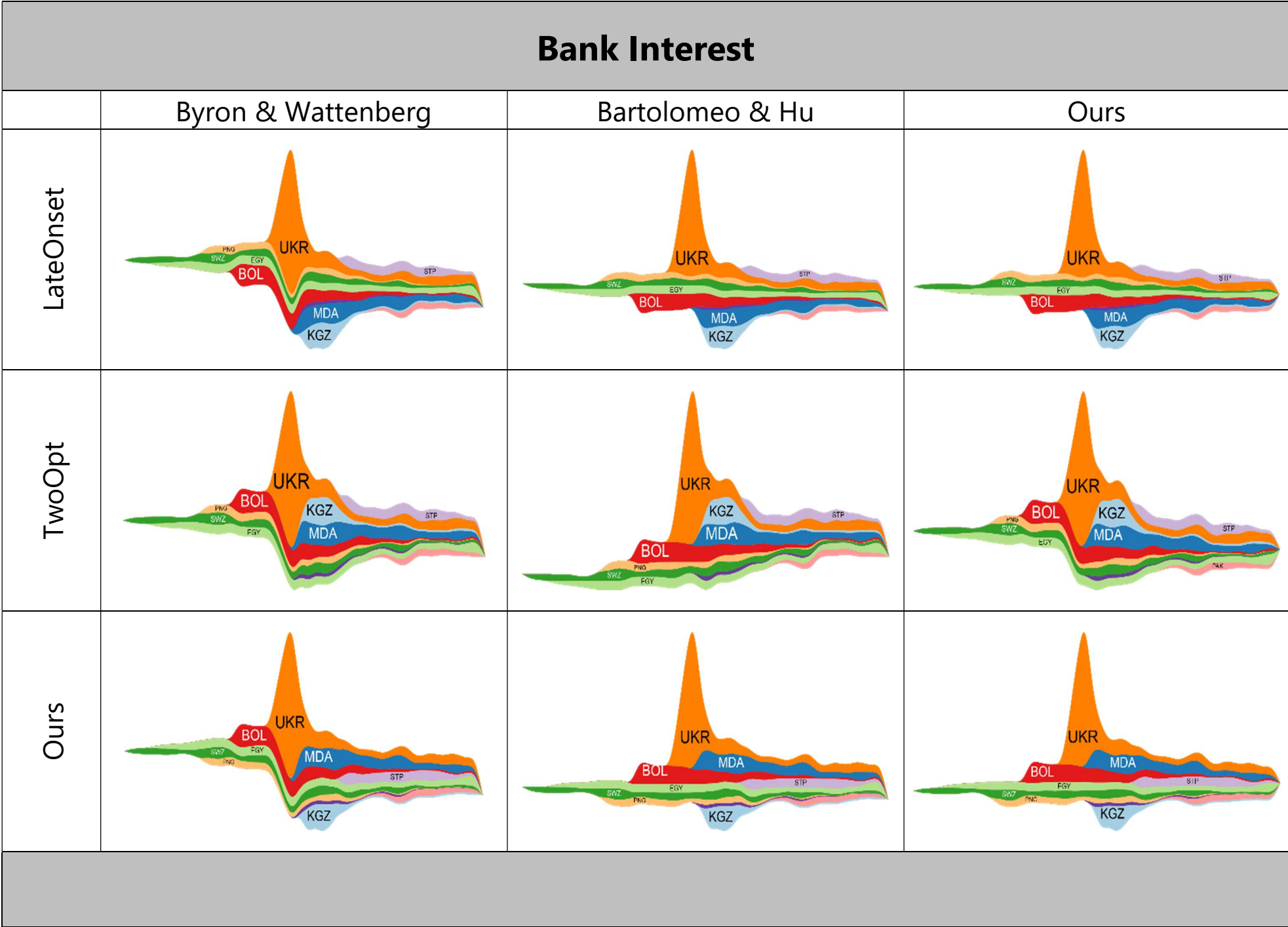
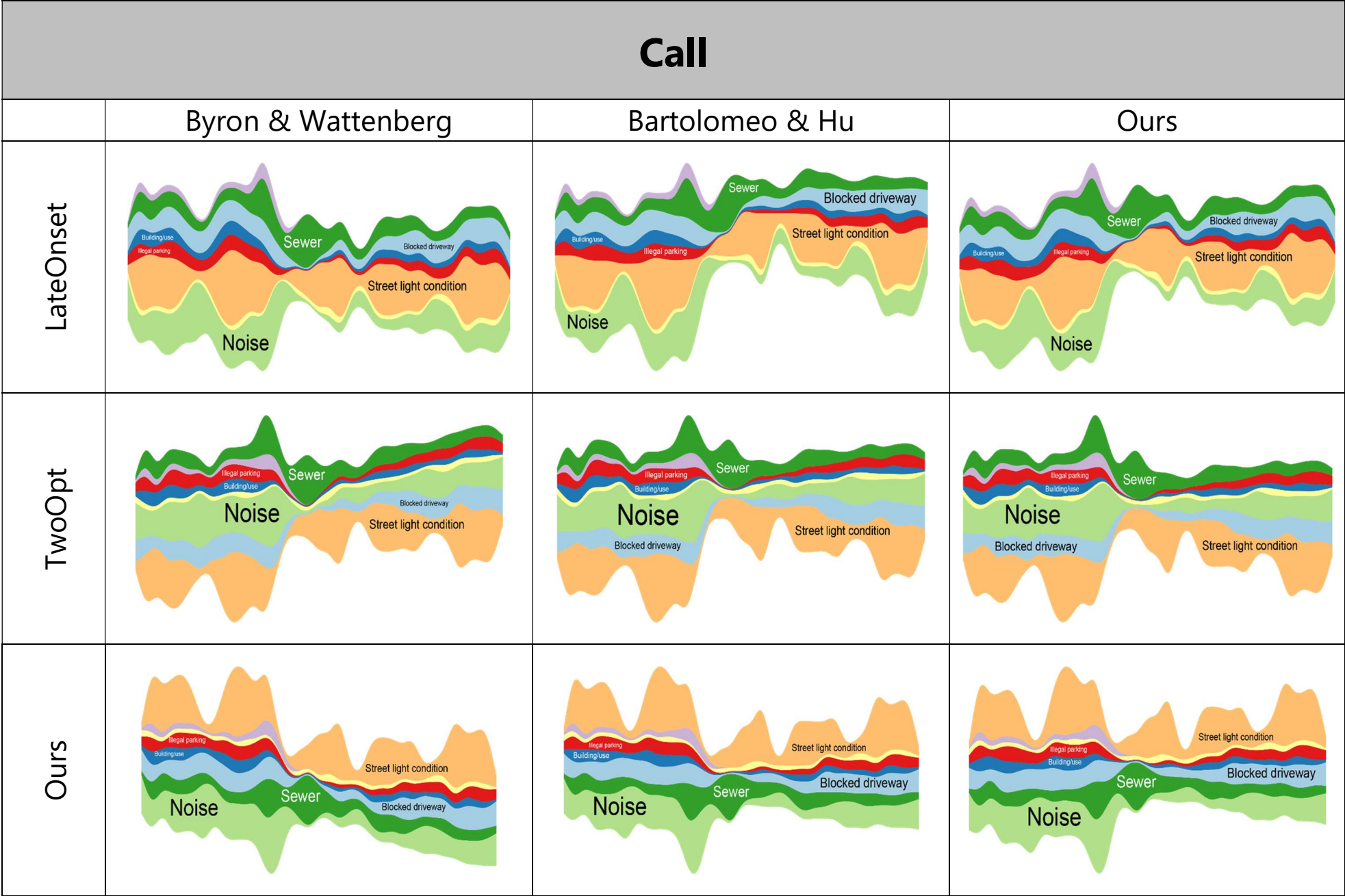
data		Layout		
<div>soil machinery</div> <div>Layers: 15</div> <div>Length: 39</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 6.51E14</div>	 <div>Sine Illusion : 4.62E15</div>	 <div>Sine Illusion : 1.74E15</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 1.37E16</div>	 <div>Wiggle_{norm2} : 1.94E16</div>	 <div>Wiggle_{norm2} : 1.74E15</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 3.80E11</div>	 <div>Wiggle_{norm1} : 4.54E11</div>	 <div>Wiggle_{norm1} : 3.78E11</div>
<div>stocks traded</div> <div>Layers: 11</div> <div>Length: 20</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 7.15E4</div>	 <div>Sine Illusion : 6.10E4</div>	 <div>Sine Illusion : 8.24E4</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 2.01E6</div>	 <div>Wiggle_{norm2} : 2.02E6</div>	 <div>Wiggle_{norm2} : 8.24E4</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 7.31E4</div>	 <div>Wiggle_{norm1} : 7.39E4</div>	 <div>Wiggle_{norm1} : 7.40E4</div>



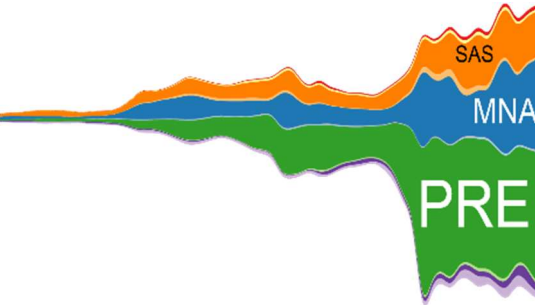
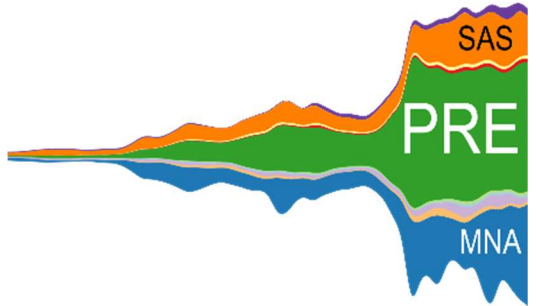

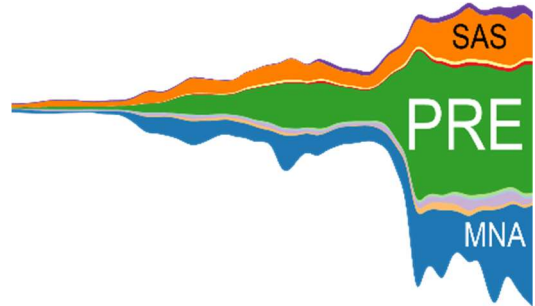
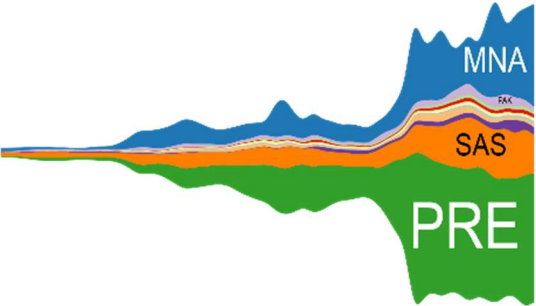
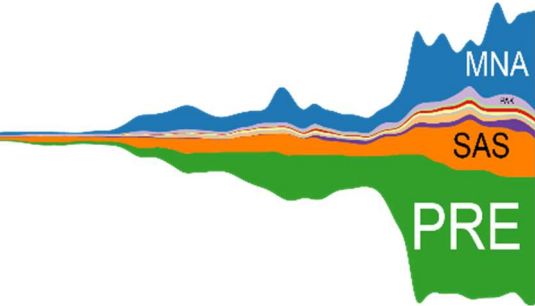
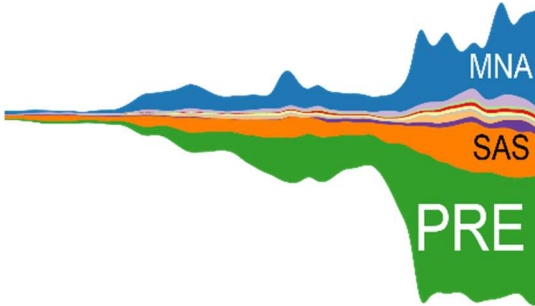
data		Layout		
technicians 1 Layers: 11 Length: 22		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <p>Sine Illusion : 2.22E6</p>	 <p>Sine Illusion : 1.23E7</p>	 <p>Sine Illusion : 2.42E6</p>
	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 1.30E7</p>	 <p>Wiggle_{norm2} : 2.91E7</p>	 <p>Wiggle_{norm2} : 2.42E6</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 2.57E5</p>	 <p>Wiggle_{norm1} : 4.08E5</p>	 <p>Wiggle_{norm1} : 2.83E5</p>
technicians 2 Layers: 13 Length: 21		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <p>Sine Illusion : 1.44E9</p>	 <p>Sine Illusion : 1.47E10</p>	 <p>Sine Illusion : 1.14E9</p>
	Wiggle _{norm2}	 <p>Wiggle_{norm2} : 3.68E10</p>	 <p>Wiggle_{norm2} : 1.05E11</p>	 <p>Wiggle_{norm2} : 1.14E9</p>
	Wiggle _{norm1}	 <p>Wiggle_{norm1} : 4.33E7</p>	 <p>Wiggle_{norm1} : 8.44E7</p>	 <p>Wiggle_{norm1} : 4.67E7</p>

data		Layout		
imports reserves 1 Layers: 10 Length: 44		Ours	LateOnset	TwoOpt
	Sine_Illusion	 Sine Illusion : 9.76E2	 Sine Illusion : 1.86E3	 Sine Illusion : 8.91E2
	Wiggle _{norm2}	 Wiggle _{norm2} : 3.88E3	 Wiggle _{norm2} : 4.57E3	 Wiggle_{norm2} : 8.91E2
	Wiggle _{norm1}	 Wiggle_{norm1} : 1.79E3	 Wiggle _{norm1} : 1.97E3	 Wiggle _{norm1} : 1.82E3
imports reserves 2 Layers: 7 Length: 44		Ours	LateOnset	TwoOpt
	Sine_Illusion	 Sine Illusion : 2.40E2	 Sine Illusion : 4.72E2	 Sine Illusion : 3.51E2
	Wiggle _{norm2}	 Wiggle _{norm2} : 9.11E2	 Wiggle _{norm2} : 1.07E3	 Wiggle_{norm2} : 3.51E2
	Wiggle _{norm1}	 Wiggle _{norm1} : 5.96E2	 Wiggle _{norm1} : 6.62E2	 Wiggle_{norm1} : 5.86E2

data		Layout		
<div>imports reserves gold</div> <div>Layers: 8</div> <div>Length: 23</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion :2.24E29</div>	 <div>Sine Illusion : 1.69E32</div>	 <div>Sine Illusion : 6.06E29</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 1.38E34</div>	 <div>Wiggle_{norm2} : 1.45E34</div>	 <div>Wiggle_{norm2} : 6.06E29</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 4.46E23</div>	 <div>Wiggle_{norm1} : 4.54E23</div>	 <div>Wiggle_{norm1} : 4.47E23</div>
<div>world disease</div> <div>Layers: 6</div> <div>Length: 14</div>		Ours	LateOnset	TwoOpt
	Sine_Illusion	 <div>Sine Illusion : 7.30E2</div>	 <div>Sine Illusion : 1.11E3</div>	 <div>Sine Illusion : 6.25E2</div>
	Wiggle _{norm2}	 <div>Wiggle_{norm2} : 2.45E3</div>	 <div>Wiggle_{norm2} : 3.57E3</div>	 <div>Wiggle_{norm2} : 6.25E2</div>
	Wiggle _{norm1}	 <div>Wiggle_{norm1} : 8.21E2</div>	 <div>Wiggle_{norm1} : 8.83E2</div>	 <div>Wiggle_{norm1} : 7.36E2</div>

Part III. The extension of Case Study



Bank Interest			
	Byron & Wattenberg	Bartolomeo & Hu	Ours
LateOnset			
TwoOpt			
Ours			

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