How to visualize your idea?

Tutorial 5: Visualization and Plotting
Xueyao Zhang

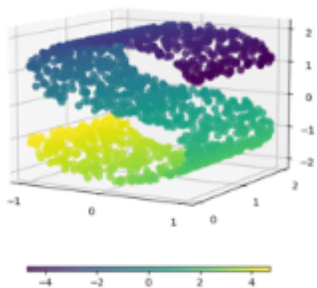CSC3160 / MDS6002, Spring 2023

Visualize what?

- Data

- Model

- Experiments

- …

- **Your idea!**

For data — **Easy to see**

- Visualize the high-dimensional data: **T-distributed Stochastic Neighbor Embedding (t-SNE)**

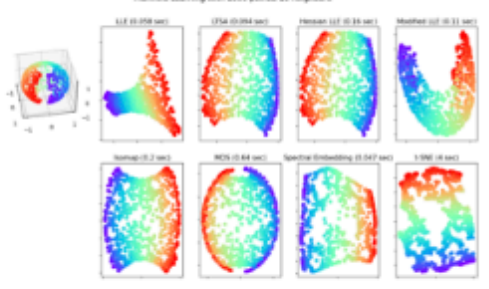- Colab Notebook: ***Visualize singing voice utterances with whisper features***

https://scikit-learn.org/stable/modules/generated/sklearn.manifold.TSNE.html
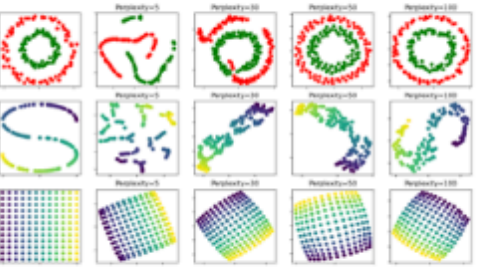
sklearn.manifold.TSNE

For data — **Easy to see**
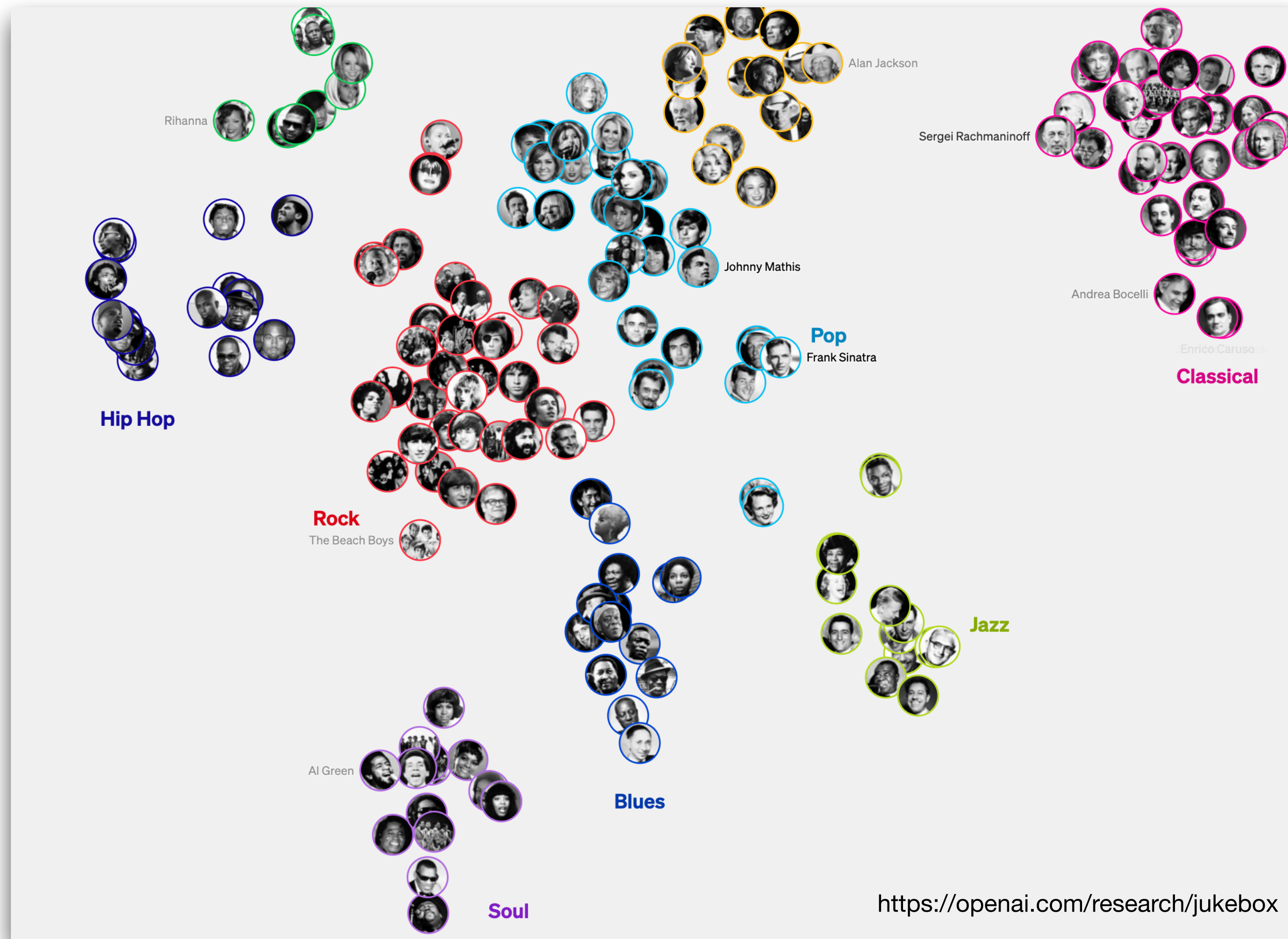
Jukebox - OpenAI

For model — Concise and clear

Transformer

https://jalammar.github.io/illustrated-transformer/

Whisper

https://openai.com/research/whisper

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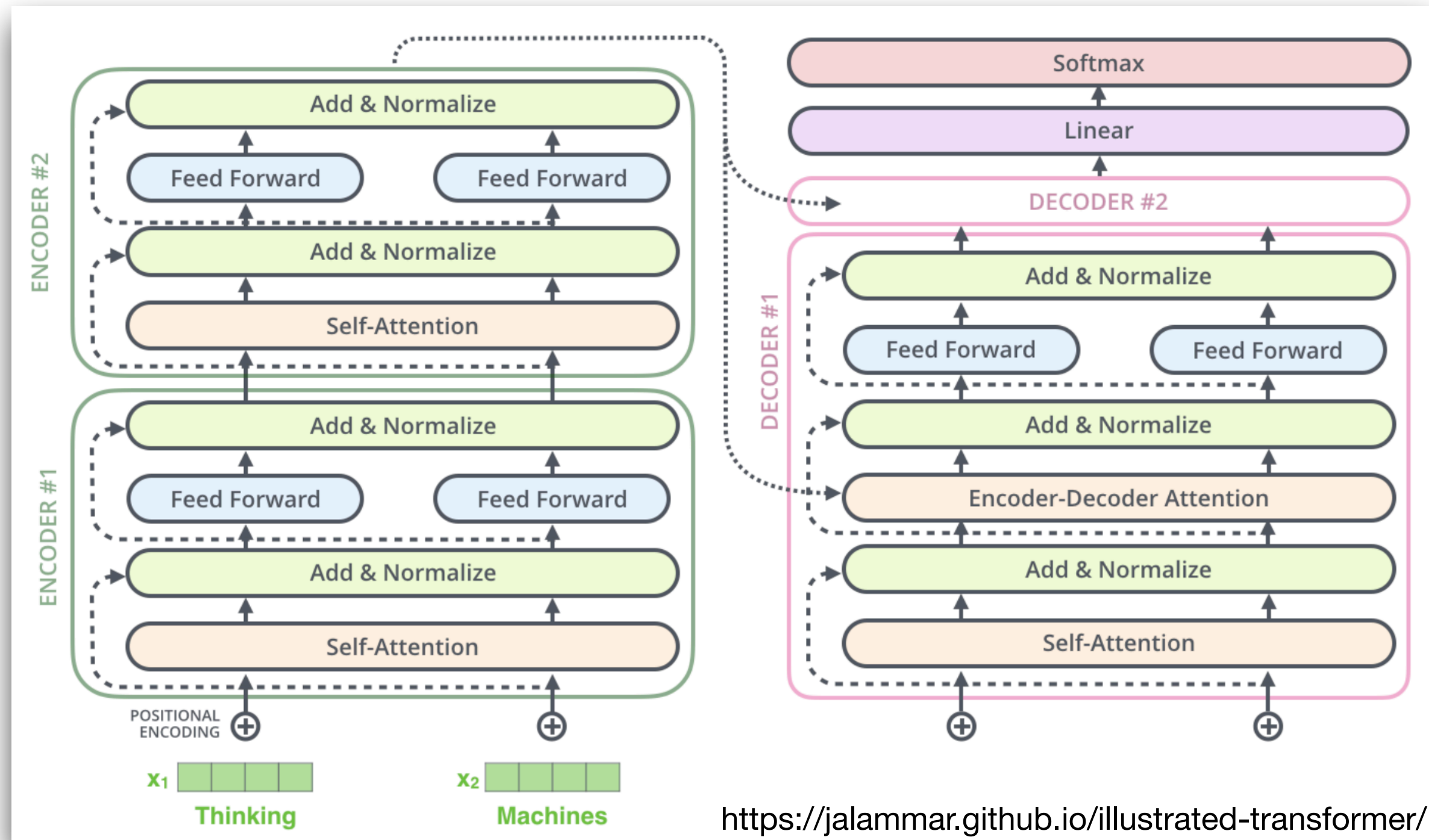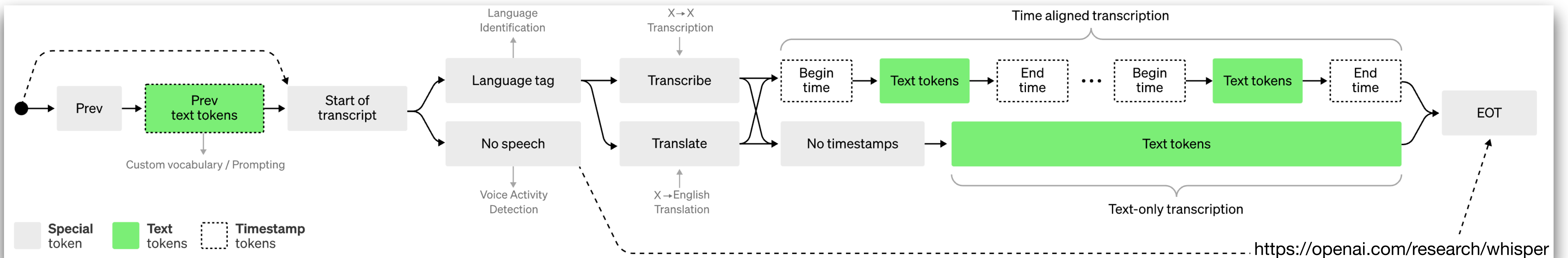
For experiments — **Better explainability**

Example gallery
https://seaborn.pydata.org/examples/index.html
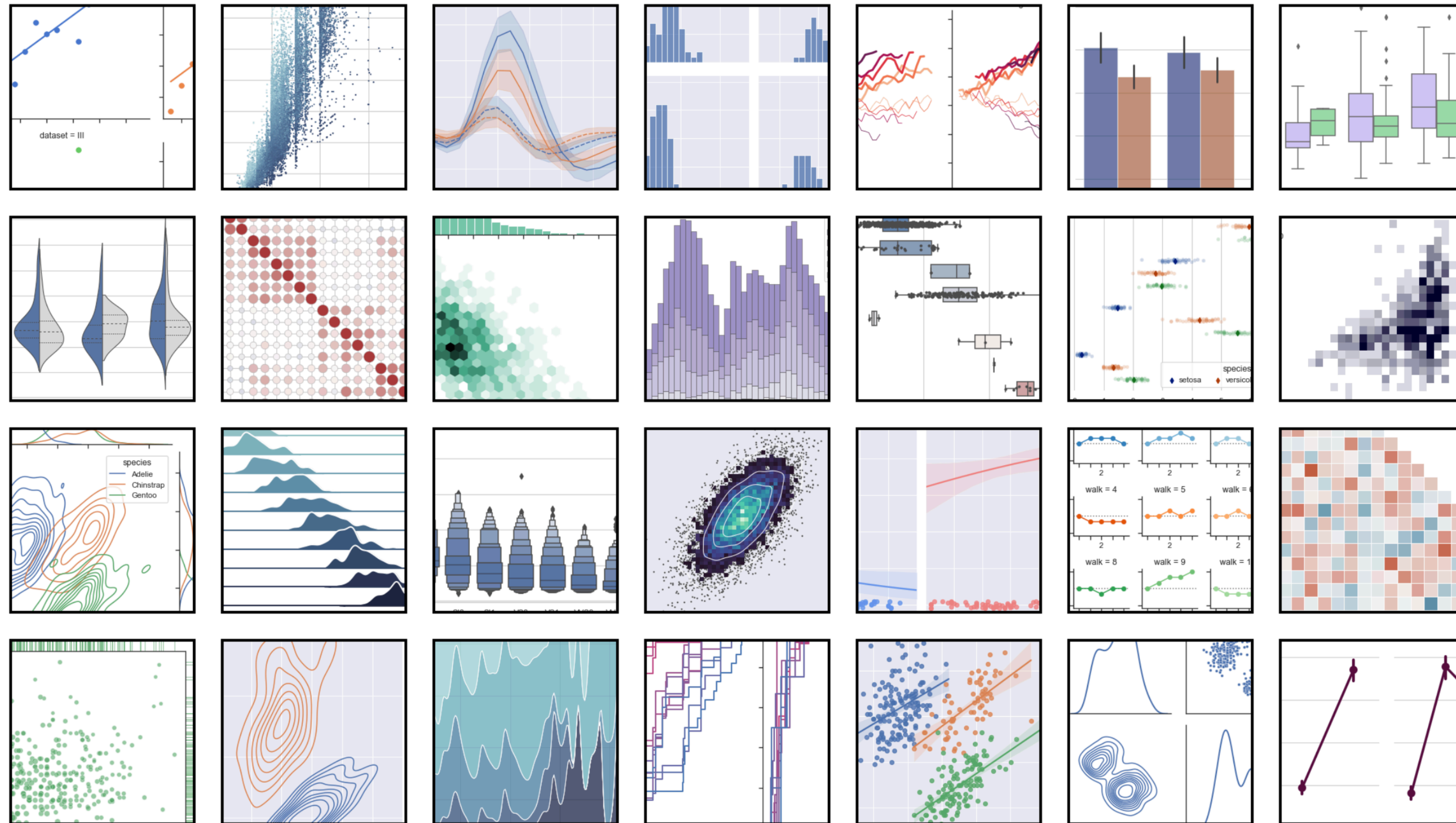
matplotlib / seaborn

For experiments — **Better explainability**

CNN Explainer

https://arxiv.org/pdf/2004.15004.pdf
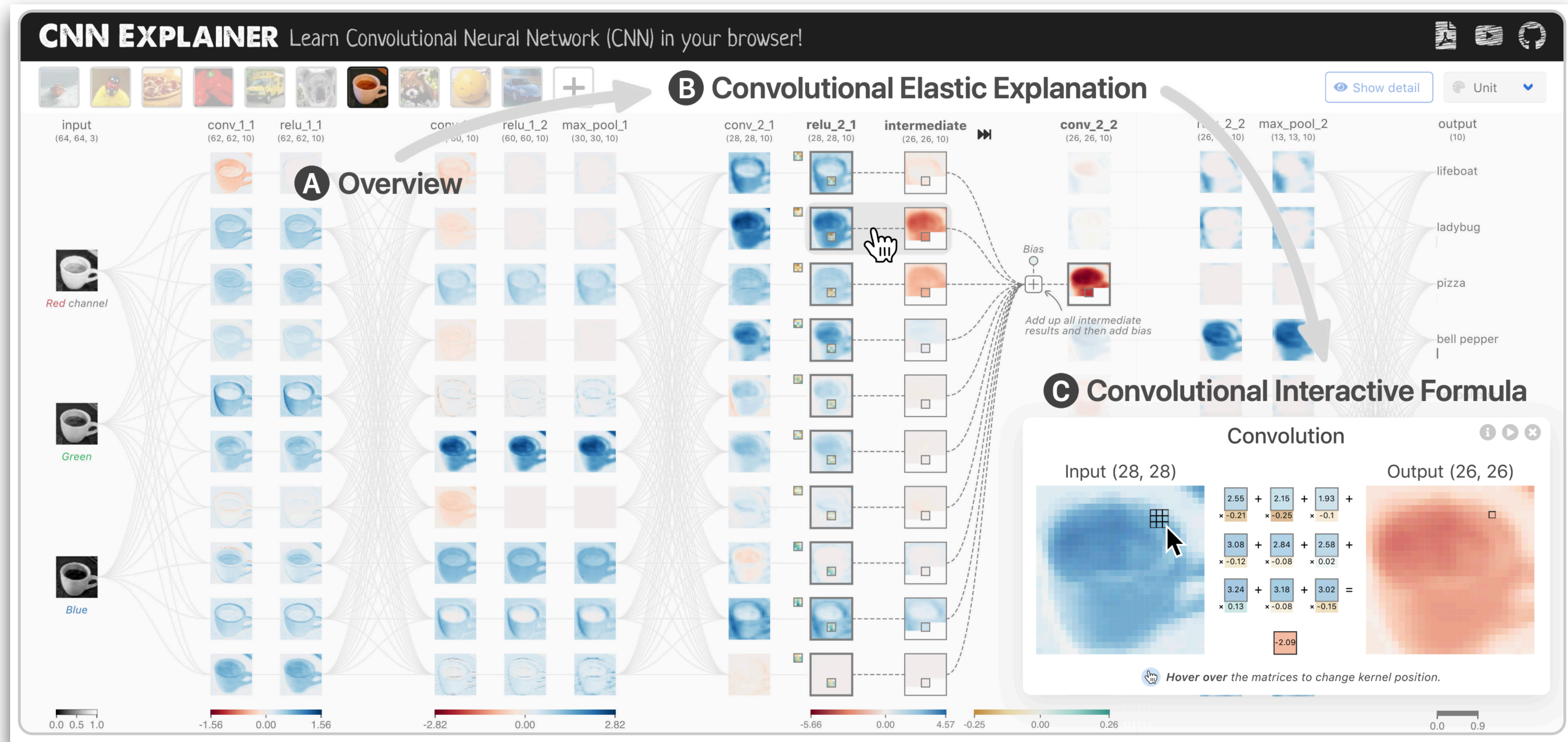
For experiments — Better explainability

Table 7: Three examples of fake news posts. Red represents pattern-preferred tokens and blue represents fact-preferred tokens. Darker color indicates a higher preference score.

| #	Post (Translated into English)
1	A group of city administration officials in Sishui , Shandong , chased an old man until all his eggs were broken on the ground . The old man sat there helplessly . The officials ran away after hitting . The white-haired man should be about 80 years old , and he can't make much money by selling eggs . So why be aggressive ? Is there no moment for the officials to be alone ? If the officials only oppresses citizens , what's the good of having these officials ? You will be punished sooner or later for bullying the underprivileged .
	Ground Truth: Fake **Judgment:** Bi-LSTM (Fake), DeClarE (Real), Pref-FEND (Fake)
2	[A student of ZJU jumping to the West Lake for a crazy graduation photo drowned] On June 29 , Xin (not his real name) from ZJU and his classmates went to the waters near the scenic spot of " Konggu Chuanyin " in Gushan , Beili Lake , West Lake in Hangzhou . Xin asked his classmates to take pictures of his swimming underwater . He jumped into the West Lake from the side of Xiling brige on Beishan Road and swam to the lotus pool of Gushan park on the other side . He drowned when swimming to the center of the lake . Recently , he has received a full PhD scholarship from a U.S. university .
	Ground Truth: Fake **Judgment:** Bi-LSTM (Real), DeClarE (Fake), Pref-FEND (Fake)
3	Is anyone in Shanghai interested in raising a dog ? No Charge . Golden Retriever , Poodle , Samoyed , and other more breeds . There are dog-killing slaughterhouses being destroyed . If no one adopts , they will be euthanized . Let these little cute lives accompany with you . If you are really not able to raise them , please forward this message .
	Ground Truth: Fake **Judgment:** Bi-LSTM (Real), DeClarE (Real), Pref-FEND (Fake)

Qiang Sheng*, Xueyao Zhang*, et al. Integrating Pattern- and Fact-based Fake News Detection via Model Preference Learning. CIKM 2021.

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For experiments — Better explainability

(a) Real piece (b) Music Transformer

(c) CP-Transformer (d) HAT
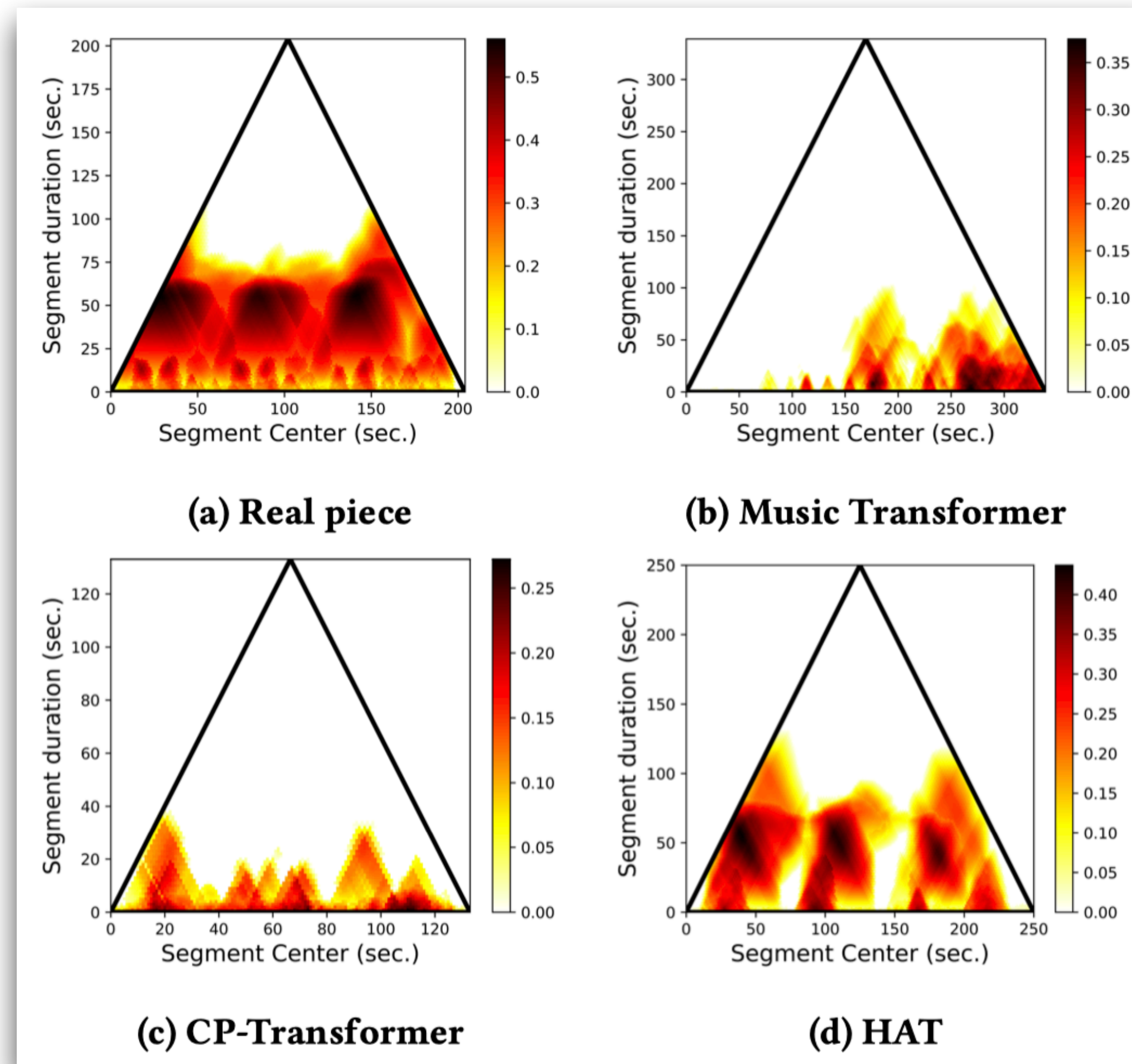
Xueyao Zhang, et al. Structure-Enhanced Pop Music Generation via Harmony-Aware Learning. ACM MM 2022.

Case Study — Using visualization in a research paper

- Qiang Sheng, et al. Zoom Out and Observe: News Environment Perception for Fake News Detection. ACL 2022.

Figure 1: To position the paper

Figure 2: To introduce the motivation

Case Study — Using visualization in a research paper

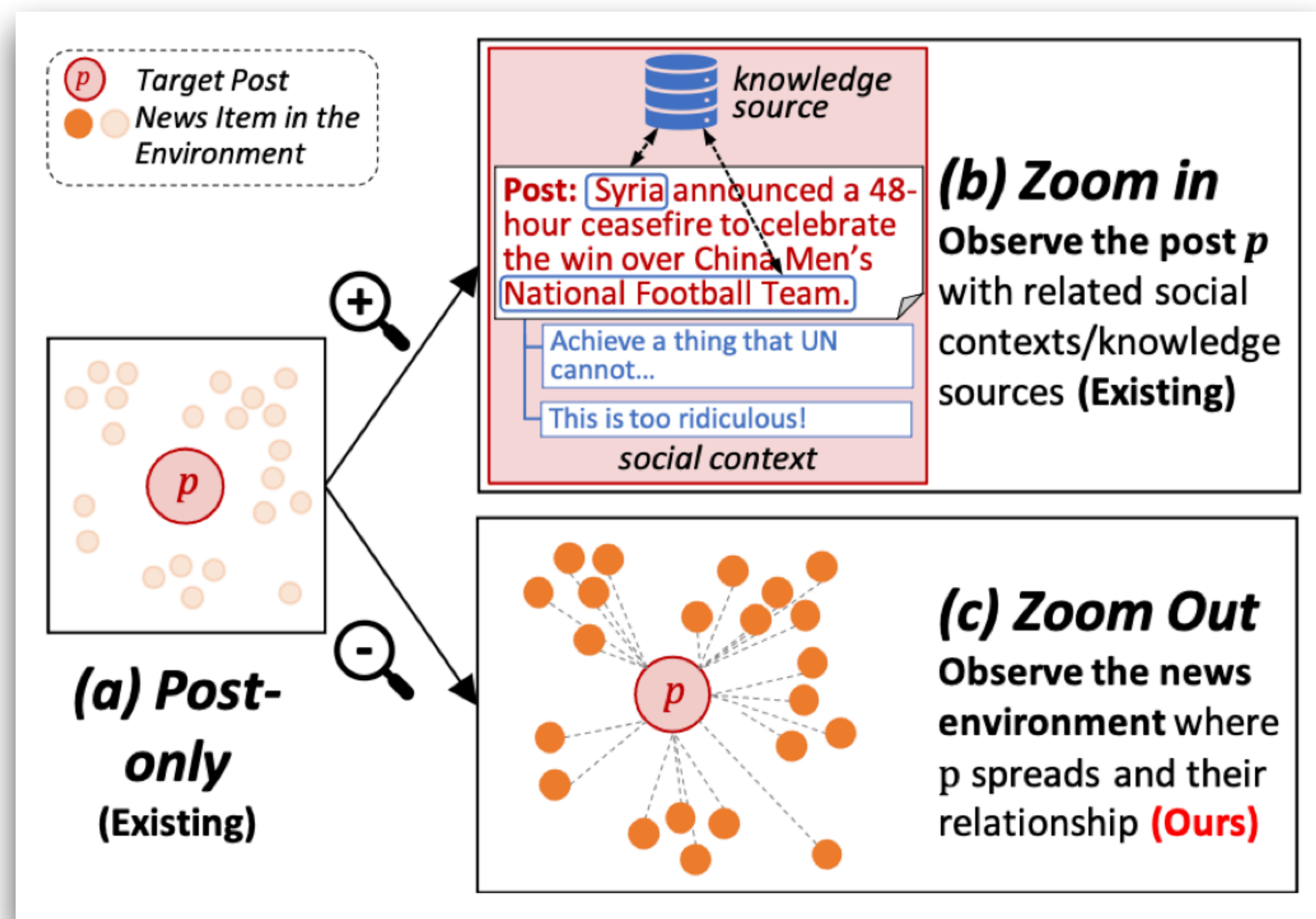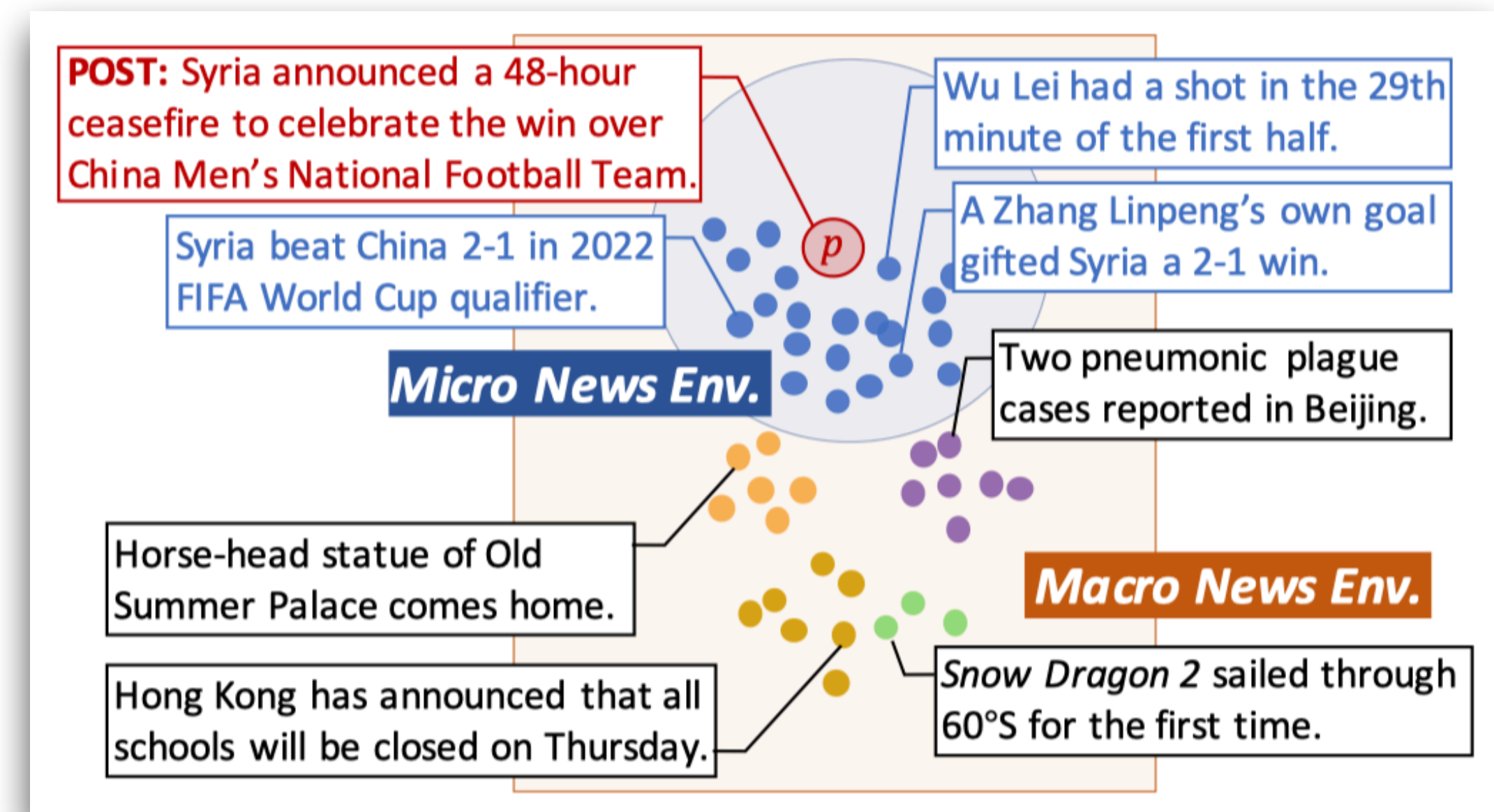- Qiang Sheng, et al. Zoom Out and Observe: News Environment Perception for Fake News Detection. ACL 2022.

Figure 3: To demonstrate how to do

Case Study — Using visualization in a research paper

- Qiang Sheng, et al. Zoom Out and Observe: News Environment Perception for Fake News Detection. ACL 2022.
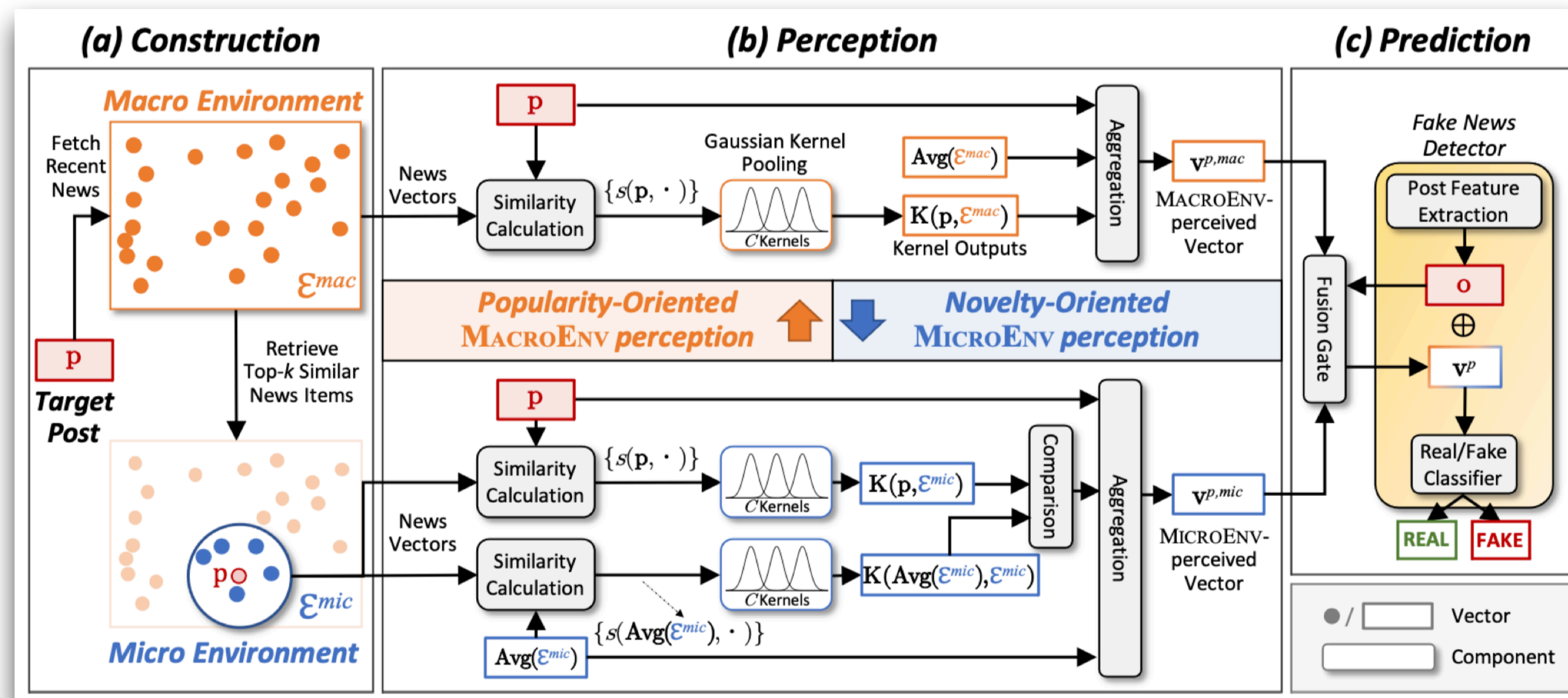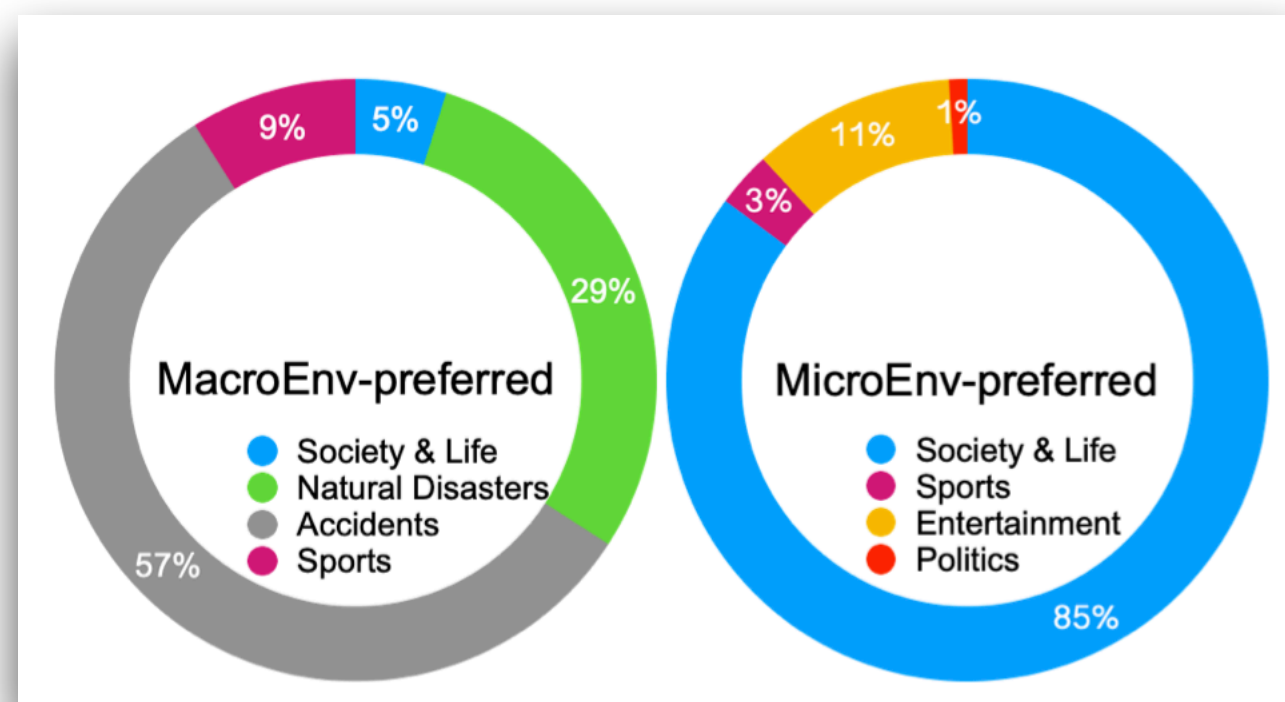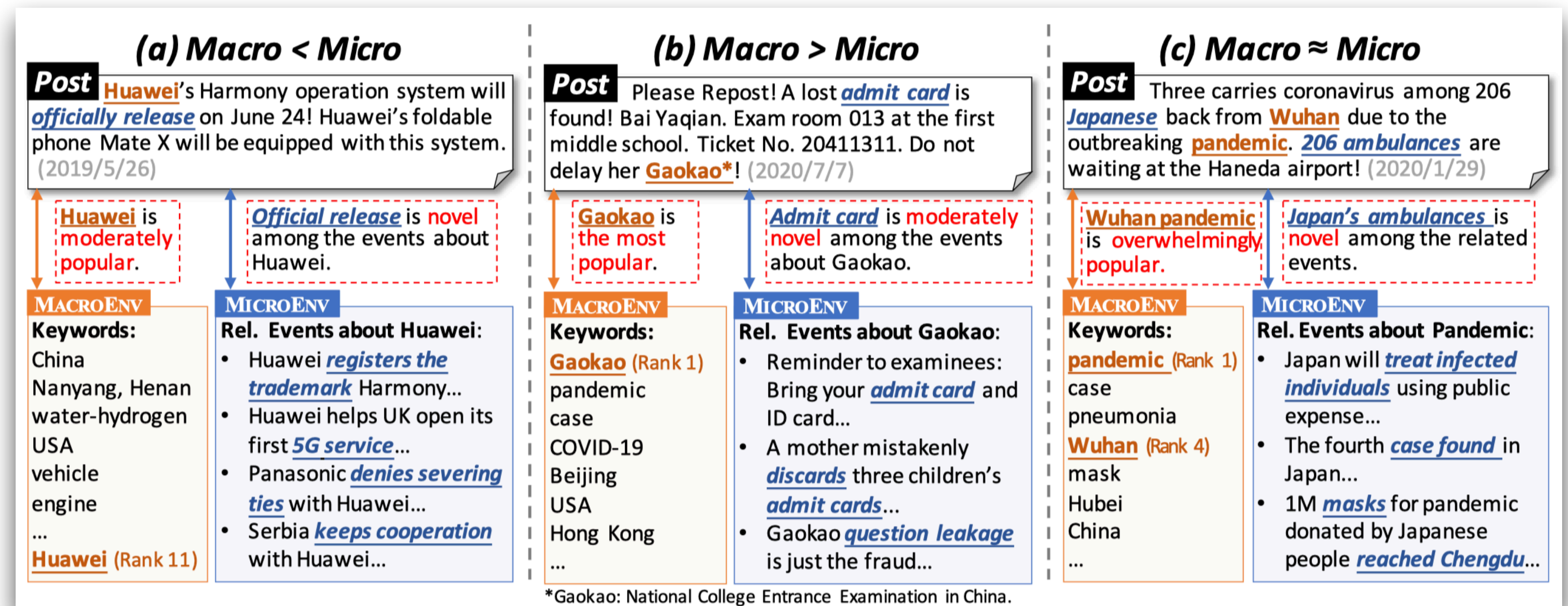

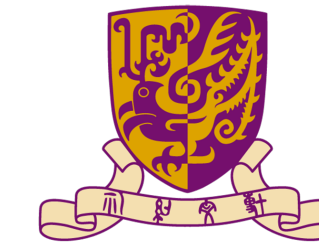**Figure 5-6: To a better explainability**

Visualization Tools

- PPT is all you need.

- Others

  ○ Google Draw

  ○ Visio

  ○ OmniGraffle

Recommended Sites

- DDA2003 Visual Analytics / MDS6112 Data Visualization

- Distill

- Jay Alammar's Blog

- Lil'Log

THANKS

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Research interest: **"AI + Music"**, especially on:
- ✦ **Singing Voice Synthesis**
- ✦ **Algorithmic Composition**

Hiring: **Our team is broadly interested in speech and music-related research.
We have open positions for RA, PhD students, and visiting students.**