



CRII: CPS: Data-Driven Cascading Failure Abstraction and Vulnerability Analysis in Cyber-Physical Systems

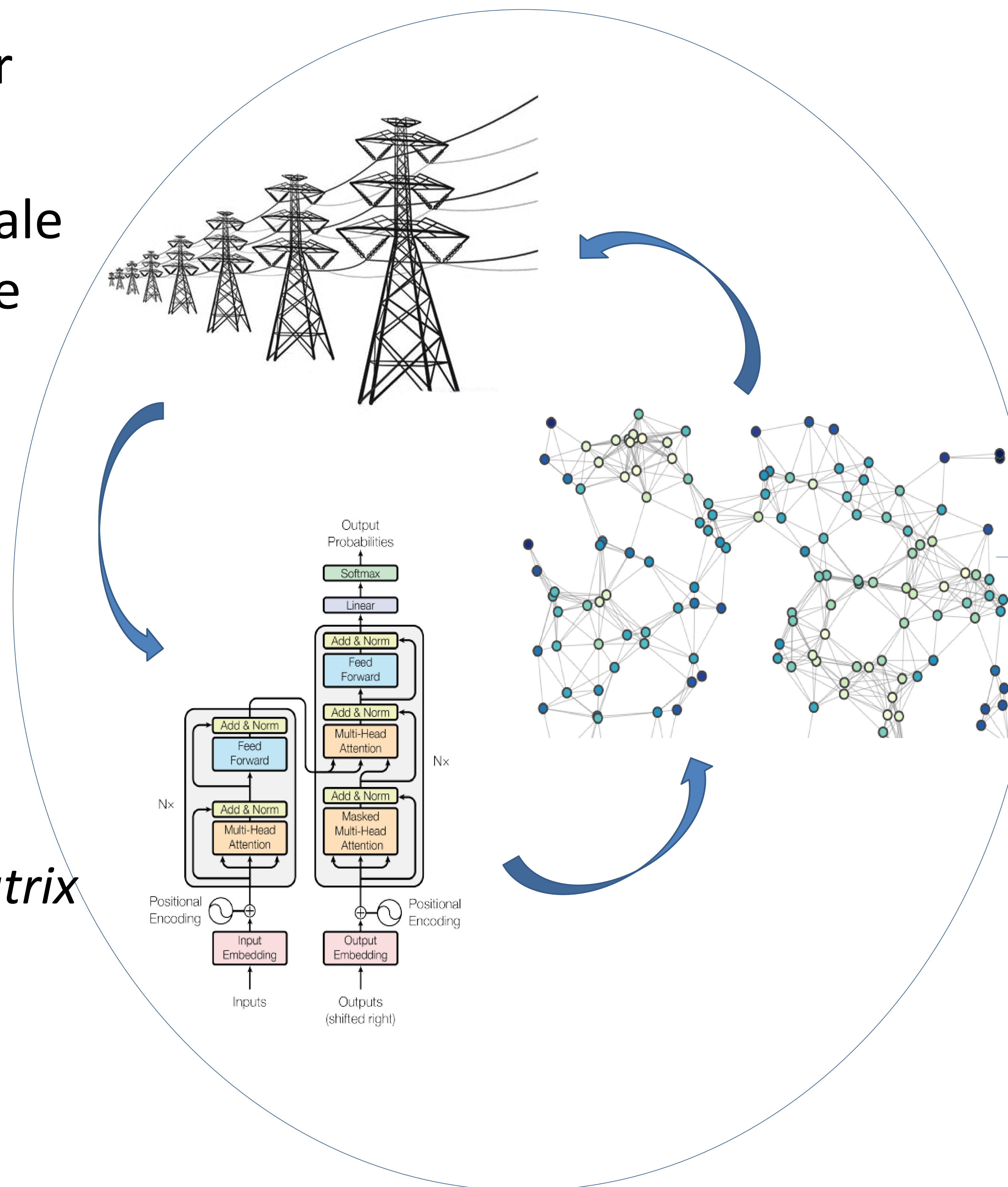
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Challenge:

- Describing CPS cascading failures with simpler models
- Quantitatively measure vulnerability in large-scale CPS systems with the simpler cascading failure models

Solution:

- Trained *the first Transformer based model* to predict CPS cascading failure and *built simpler cascading failure models using the attention matrix*
- Developed *new dynamic and adaptive sampling algorithms* for cascade models



Scientific Impact:

- Using Transformer to predict cascading failures can be helpful to simplify any complicated cascading process
- The developed sampling methods in large-scale networks can be extended to any networks with the diffusion phenomenon

Broader Impact:

- Research opportunities for high school students and students from underrepresented groups
- Senior design project opportunities
- Disseminated research results to high school and undergraduate students in workshops