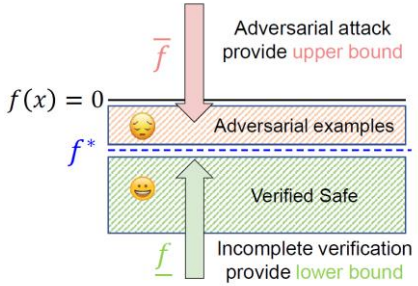
Collaborative Research: FMitF: Track I: Towards Verified Robustness and Safety in Power System-Informed Neural Networks

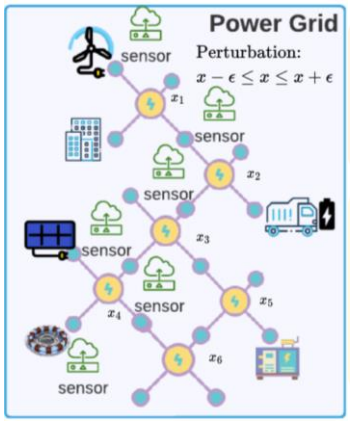
Challenge:

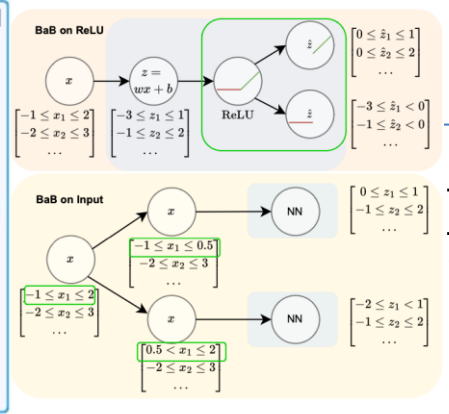
- Neural networks in power systems are vulnerable to perturbations and attacks
- Ensuring robustness (under physical constraints) is vital to prevent power outages and economic losses



Solution:

- Neural Network Verification with Power System Constraints and Certified Model Training
- Topology-Aware Learning and Power System Dynamic
- Verification boosted sensitivity analysis





Scientific Impact:

- Enhance neural network verification with power system constraints and topology.
- Improves "correct-by-construction" through verification, certifiable training, and sensitivity analysis.

Broader Impact and Broader Participation:

- Improving power system safety while enhancing the trustworthiness of AI systems
- Engaging students in interdisciplinary studies
- Benefiting communities and industries.
- Integrating research into courses and promoting diversity

Award number: **2319242, 2319243**

Institute: Drexel University & Illinois Institute of Technology
Contacts: kx46@drexel.edu; rwang74@iit.edu