

Talk Title

Fundamentals and Frontiers in Machine Learning

Tackling complex computer science problems becomes more manageable when we draw from unsolved math puzzles and nature's inspiration. We have the opportunity to craft clever computer algorithms, like those for optimization, hashing functions, data/model compression and cleaning, and metrics. These algorithms play a vital role in addressing a wide range of challenges in AI and cybersecurity.

Various projects will be presented, covering:

- Dynamic Weighting in ML
- Path and walk signature
- Extracting and choosing the most important features
- Delving into deep learning, which involves suggesting sophisticated designs, fine-tuning techniques, specialized loss functions, and activation functions.
- Identifying anomalies and utilizing clustering methods
- Implementing a dynamic Markov Chain paired with reinforcement learning to enhance optimization and select features.
- Developing models for biomedical and bioinformatics applications
- Applying Number Theory in the realm of security, including functions like hashing and RSA encryption.
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