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Gaussian Processes with Graph-Structured Data
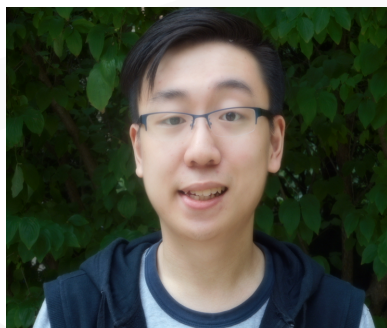
WHEN
December 8, 2021
2:00 PM, CST

WHERE
Via ZOOM
ZOOM information will be provided in the email announcement for this seminar.

Zehao Niu, PhD candidate

We propose to introduce a new family of Gaussian Processes for graph-structured data that mimic the computation of wide graph neural networks. We draw inspiration from two main fields that has attracted significant attention recently: First, graph neural networks with powerful performance in semi-supervised learning. Second, connections between Gaussian Processes and infinite width neural networks.

On several problems, we obtain better predictive results than previous, leading benchmarks from both graph neural networks and traditional Laplacian and embedding based methods with such Gaussian Processes.

We propose to further the study in three possible directions. First, developing efficient algorithms to reduce the computational cost while preserving accuracy. Second, finding uncertainty estimates and tuning hyper-parameters based on the Gaussian Process Classification framework. Third, extending the Gaussian Processes to a wider range of advancements in graphical neural networks.

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