

Research project and supervisory team

Supervisory Team	Amin Farjudian Jim Greer
Short introduction & description of research project	<p>Neural network based learning has become the dominant paradigm in modern machine learning. Although the success stories of machine learning---especially deep learning---have garnered significant attention, there are fundamental challenges that must be addressed before neural networks may be deployed as reliable components in safety/mission critical systems. Some of the notable challenges include interpretability, robustness, and cost of training.</p> <p>To address these challenges, a systematic approach based on sound mathematical principles must be adopted. At the same time, such research must be guided by the insight obtained from practical applications of machine learning.</p> <p>The aim of this proposal is to study computational properties of neural networks at a fundamental level. We analyze salient aspects such as scalability, accuracy, robustness and interpretability of machine learning systems deployed in engineering applications. The proposal is part of a broader cross-disciplinary project that involves electrical engineering, chemical engineering, and material sciences. As such, this is an ideal opportunity for candidates who are interested in fundamental research which can also broaden their understanding of science and engineering by collaborating with researchers from a variety of disciplines.</p>
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