Brain-Inspired Artificial Intelligence (AI)

Spring 2020

Instructor: Dhireesha Kudithipudi, PhD

Course #: CPE 4953.001

Time: T/Th 10:00 AM- 11:15 AM

Open to all ECE & CS undergraduate and graduate students; Students from other majors can email instructor for details.

In this course students will acquire skills in modeling AI systems inspired by neural processes and apply this knowledge to real-world cognitive tasks. Unlike a computer, the human brain is massively parallel, continually processes and learns from noisy, streaming data, operates on an ultra-low energy budget and exhibits a high degree of robustness. The rapidly growing field of brain-inspired AI seeks to achieve these same qualities in artificial systems.

The course will offer insights into how brain physiology and information processing give rise to higher-order intelligence. We will study single neuronal models, spiking neural networks, deep learning, supervised/unsupervised learning rules, temporal signal classification and prediction and large-scale neuromorphic accelerators. Course includes research paper critiques, presentations, assignments and final team project that will help critical thinking and a deeper understanding of the content.

Prereqs: An undergraduate level understanding of computing, probability, algorithms, and linear algebra is assumed. Proficiency with either Python or Matlab, and high-level programming language is expected.