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Dept. of Computer Science
University of Houston
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Objectives

Apply machine learning and data analysis techniques on scientific applications, mainly PHYSICS and ASTRONOMY.

To develop new machine learning tools by designing new learning mechanisms.
I have the privilege of working with the following students:

**Bachelor’s in Computer Science**

• Asadourian, Vicken

**Masters in Computer Science**

• Boumber, Dainis

**Doctorate in Computer Science**

• Dhar Gupta, Kinjal
• Mehrparvar, Behrang
• Pisheh, Zahra
• Toti, Giulia
• Valerio, Roberto
Artificial Intelligence

- Planning
- Search

Machine Learning

- Knowledge Representation
- Robotics
- Reinforcement Learning

Clustering

Genetic Algorithms

Classification
Applications Machine Learning

- Bio-Technology
  - Protein Folding Prediction
  - Micro-array gene expression

- Computer Systems Performance Prediction

- Banking Applications
  - Credit Applications
  - Fraud Detection

- Character Recognition (US Postal Service)

- Web Applications
  - Document Classification
  - Learning User Preferences
Astroinformatics is a recent interdisciplinary field of science that applies modern computational tools to the solution of astronomical problems.
Automatic Geomorphic Mapping and Analysis of Land Surfaces Using Pattern Recognition
Automatic Cepheid Variable Star Classification
Cepheid Variable Stars
Problem: How do we handle data from different galaxies?
Meta-Learning, Transfer Learning, Self-Adaptation

Source domain

DB1

DB2

Learning System

Learning System

Knowledge

DB new

Target domain

Learning System
THANK YOU