PatternAnalysisLab

UNIVERSITY of HOUSTON

finding meaningful patterns in scientific data

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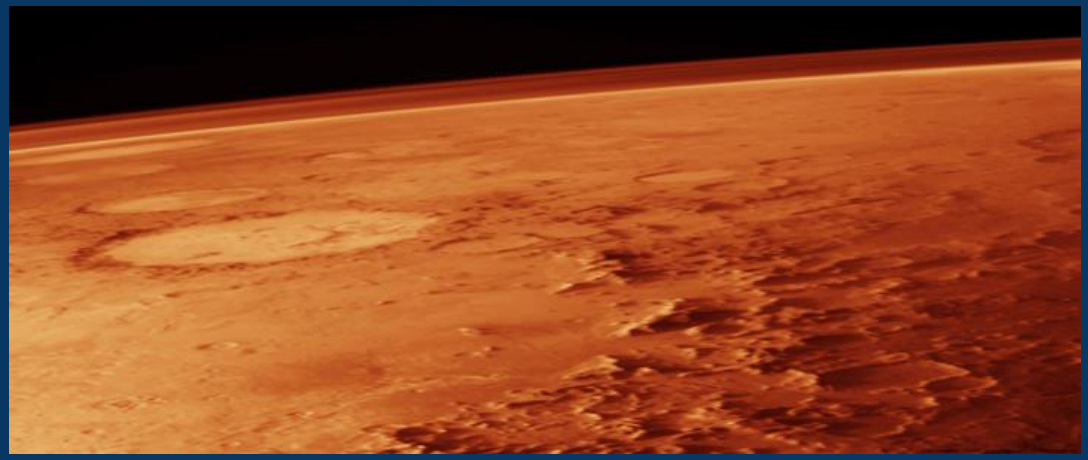
Objectives

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

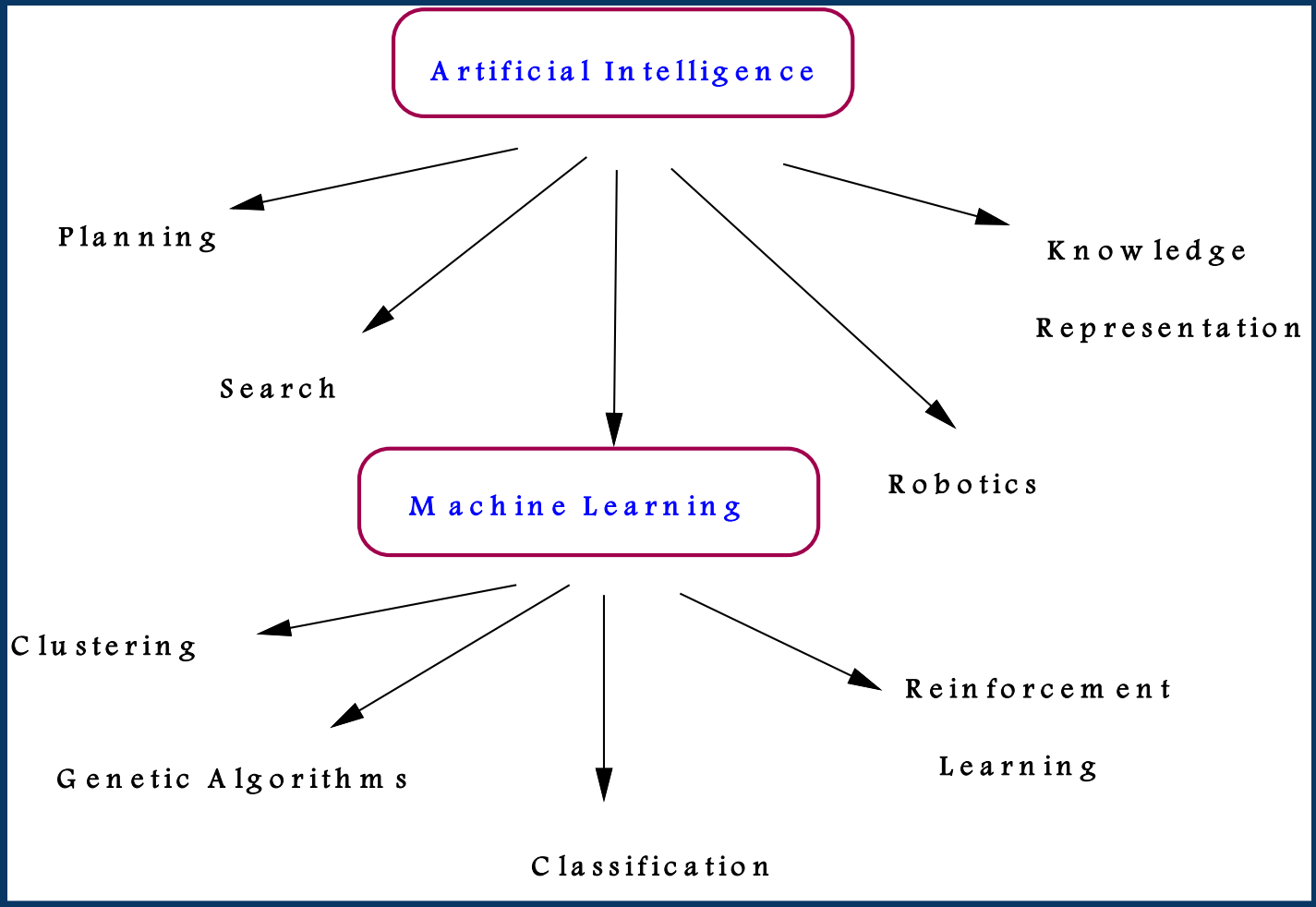
- Asadourian, Vicken

Masters in Computer Science

- Boumber, Dainis

Doctorate in Computer Science

- Dhar Gupta, Kinjal
- Mehrparvar, Behrang
- Pisheh, Zahra
- Toti, Giulia
- Valerio, Roberto

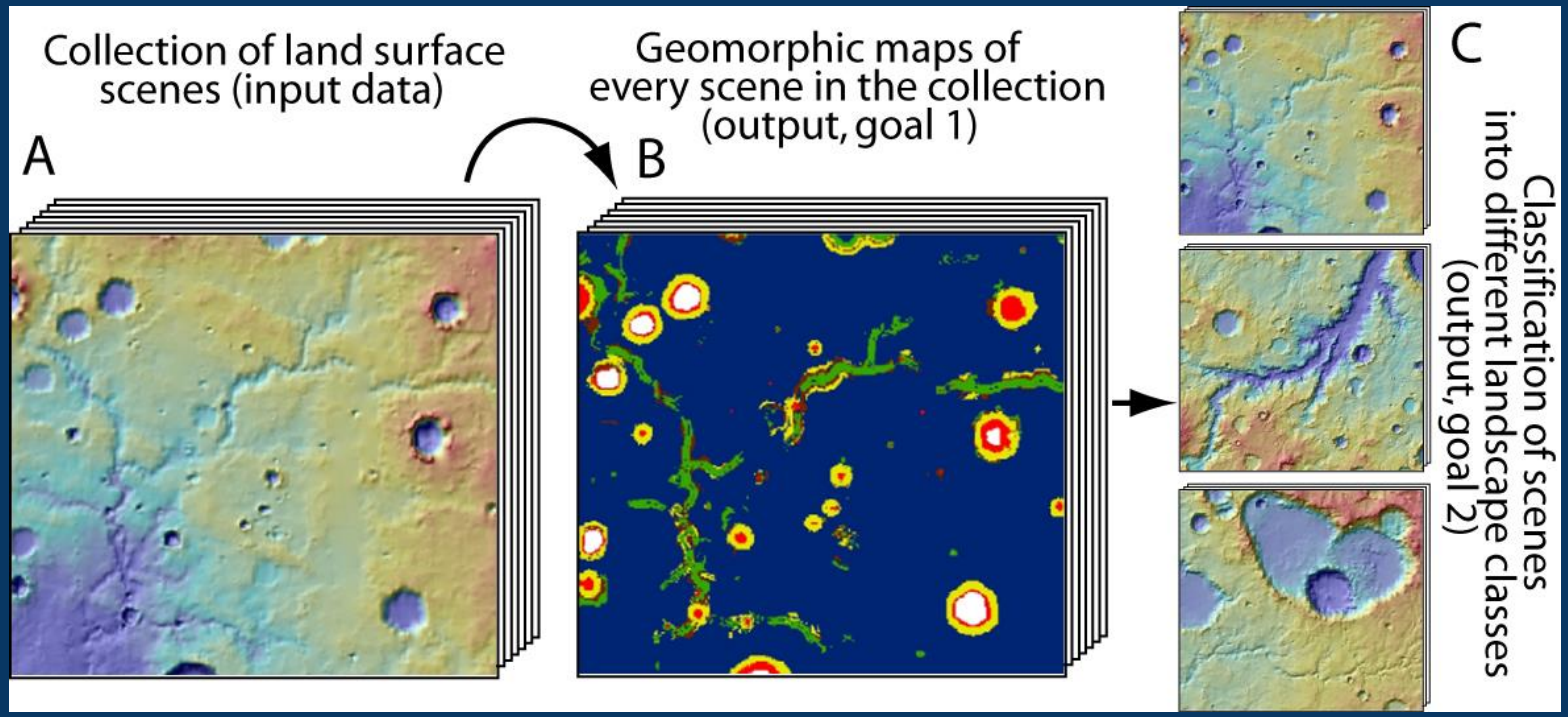

Artificial Intelligence
Planning
Search
Knowledge
Representation
Robotics
Machine Learning
Clustering
Genetic Algorithms
Classification
Reinforcement
Learning

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.

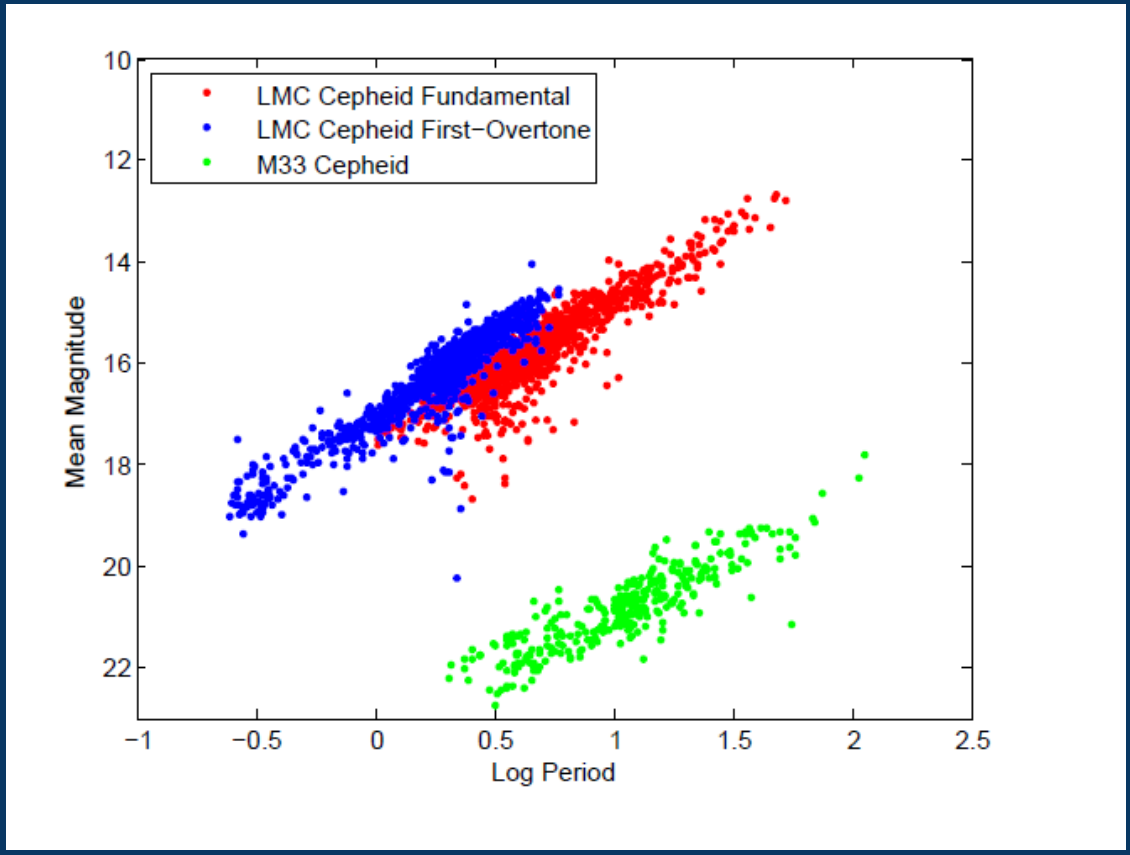
Automatic Geomorphic Mapping and Analysis of Land Surfaces Using Pattern Recognition

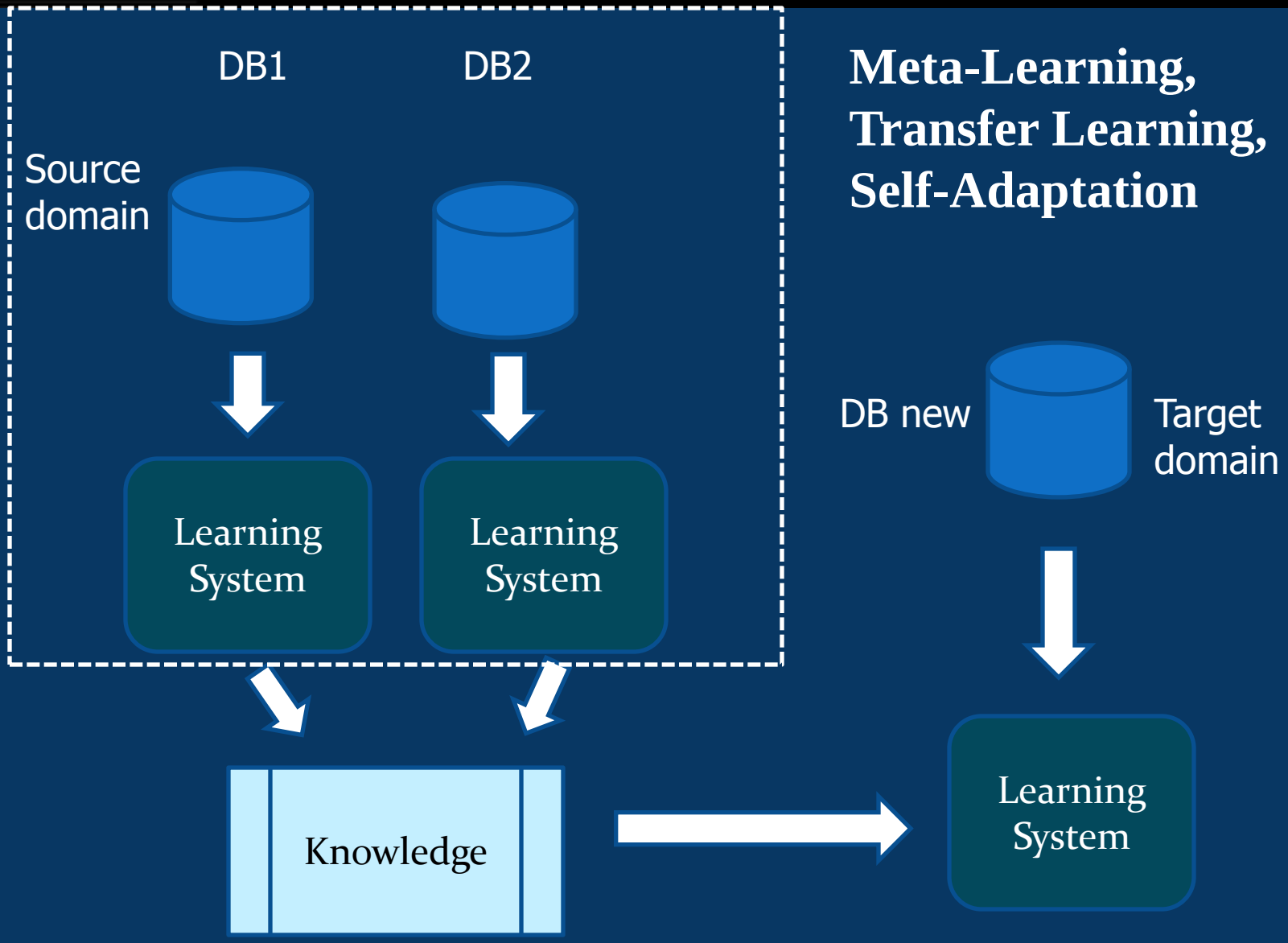


Automatic Cepheid Variable Star Classification

Cepheid Variable Stars

Problem: How do we handle data from different galaxies?





Meta-Learning, Transfer Learning, Self-Adaptation

THANK YOU