

Hofstra University

Big Data Laboratory Robotics and Advanced Manufacturing Laboratory

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Big Data Laboratory (BDL)

Objective

- Goal is to educate Computer Science (CSC) students in all aspects of large and distributed information systems:
 - System development, testing, data security and privacy, data integration, networking, cyber-security and application development.
- Prepare CSC for highly-skilled jobs in emerging and fast growing IT industries such as data analytics and data integration, cloud computing, cybersecurity, health-care informatics, and finance.

Curricular Enrichment Through BDL

- CSC 125: Concurrent and Distributed Computing (Spring 2015)
- CSC 150: Semantic Web (Spring 2015)
- CSC 175: Computer Networking (Spring 2015)
- CSC 190: Software Engineering (Spring 2015)
- CSC 112: Operating Systems (Fall 2015)

Research Project Funded by NSF

WISE Guys and Gals - Boys & Girls as WISEngineering STEM Learners

- WISEngineering is a web-based educational system that integrates various advanced features such as user behavior tracking and automated grading that supports an engineering curriculum in an informal learning environment.
- The project uses an NAS server of 10TB and runs on a cluster of 6 nodes.



Over 2 PB of raw storage; 420 TB of server storage.



Student Projects Currently Utilizing BDL

Master Capstone Project Fall 2014

Enhancing Malware Trace Mining With
Cloud Caching

Faculty advisor: Dr. Xiang Fu

- Malware poses a greater threat in an increasingly digital world
- More sophisticated malware is problematic for traditional analysis techniques
- Traditional malware analysis employs emulation and virtualization to safely observe the behavior of rogue software
- A new analysis tool called EVMine analyzes malware by caching large data files which contain traces of malware

Senior Project Spring 2015

A Hadoop Based Trading Platform and
Financial Optimization System

Faculty advisor: Dr. Xiang Fu

- Developed an educational stock trading platform for optimizing the parameters of financial models
- Leverages a distributed HBASE database to store the vast amount of historical trading data
- The research engine is based on Hadoop, and accepts upload of bytecode of financial models implemented using Java
- The research engine runs hundreds of parallel threads against historical data to find optimized parameters

Senior Project Spring 2015

Semantic Web Date/Meetup Application

Faculty advisor: Dr. Knarig Arabshian

- Developed the go-to date planning and meetup application using Semantic Web technologies
- Eliminates the need to manually search on many individual websites and returns accurate results in a single query
- Applications will be able to query specific objects and find exact or similar matches
- Aims to perform a context-aware search that takes into account users' preferences and locations

Robotics and Advanced Manufacturing (RAM) Laboratory

Objective

- Goal is to educate students in many aspects of robotics and mechatronics:
 - Machine design, system integration, reverse engineering, model-based design, feedback and control
- Prepare students for highly-skilled jobs in design and manufacturing of complex systems in aerospace, mechatronics, robotics, biomedical fields

Curricular Enrichment Through RAM Lab

ENGG 130: Modeling and Analysis of Dynamic Systems	Fall 2015
ENGG 160A: Measurements and Instrumentation Laboratory	Fall 2015
ENGG 141: Mechanical Analysis and Design	Fall 2015
ENGG 143D: Design of Multidisciplinary Engineering Systems	Fall 2015
ENGG 129 Mechanical Vibrations	Spring 2016
ENGG 142: Mechatronic System Design	Spring 2016
ENGG 179: Control Systems Engineering	Spring 2016

Experimental Measurement of End-Plate Effects on Forces on Airfoil Sections

Faculty Adviser: David Rooney

- Used 3D Printer to manufacture different airfoil configurations to be tested in the Low Turbulence Subsonic Wind Tunnel
- Examined the effect of two endplate geometries on the aerodynamic coefficients of the airfoils
- Modeling offers insights into full-scale performance of airplane wings

Optimization Surface Topography for Tissue Engineering

Faculty Adviser: Sina Rabbany

- Laser Etcher was used to create innovative surface topographies on polystyrene for cell and tissue engineering purposes
- Experimented with machines setting including power, speed, and resolution to form the optimal surface for cell growth
- The Scanning Electron Microscope (SEM) was used to quantify the depth and width of the micro channels



Center for Innovation

How It Operates

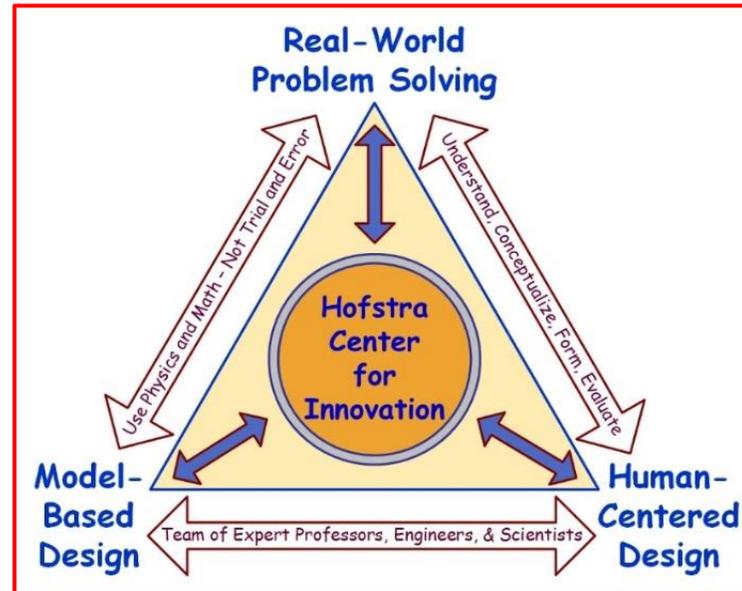
- Extensive use of RAM Lab
- Partnerships between Hofstra University and local and national industry
- Projects run for 3 to 12 months
- All IP is held by the partnering company
- Overhead cost is used for SEAS labs

Current Industry Partners

- Pitney Bowes
- Rockwell Automation
- Hayes Performance Systems
- Feinstein Institute for Medical Research

Mechatronics Certificate Program

- One year on-line/on-campus hybrid program for practicing engineers



The screenshot shows the INNIVATELI website, which is part of the PARR Organization. The website features a navigation menu with links for HOME, NEWS, OPINION, BIOTECH, IT, and CLEAN ENERGY. The main headline reads "At Hofstra, Collaboration Without Losing Your Stuff". Below the headline is a photograph of a 3D printer printing a purple object. The text below the photo states: "Hofstra's Center for Innovation is already at work on projects that could rock business and medicine." The article is dated APRIL 22, 2015, and is by GREGORY ZELLER. The article discusses the importance of intellectual property rights in university-industry collaborations and how Hofstra's Center for Innovation handles them.