NSF I/UCRC Center for Big Learning

Creating Intelligence
National Science Foundation Industry & University Cooperative Research Center

Vision: Creating intelligence towards intelligence-driven society.

Mission: The mission of the NSF I/UCRC Center for Big Learning (CBL) is to explore and pioneer research frontiers in emerging large-scale deep learning for a broad spectrum of big data applications, design novel cloud services and big systems to enable big learning research and applications, transfer research discoveries to meet urgent needs in industry with our diverse center members, and nurture our next generation talents in a mixed academic and industry setting with real-world relevance and significance via the industry-university consortium.

Big Learning Consortium: The consortium currently consists of four academic sites across the country and a large number (50+) of industry partners: Carnegie Mellon University (CMU, East), University of Florida (UF, South), University of Missouri at Kansas City (UMKC, Central), and University of Oregon (UO, West). Faculty members (60+) at these four sites have comprehensive expertise, covering key research themes and application disciplines. We welcome more industry partners and academic sites to join us. The consortium is sponsored by NSF and industry members/partners over the world.

Thrust Areas

- **Deep Learning**
  - Deep Architecture, DNN, DBN, CNN, RNN, LSTM, DRL, Brain-Inspired Algorithms
  - Media (Image, Video, Speech, Text), Data (Business, Health, Life, Eng., Science)

- **Conventional Machine Learning**
  - Supervised, Unsupervised, Reinforcement Learning, Graphical Models, Kernels
  - Learning Representation, Transfer Learning, Active Learning, Ensemble

- **Big Data**
  - Distributed Data Store, Distributed File Systems, Big Data Processing Platform
  - Large Data Analytics, ETL, Visualization, Data Warehouse, Data Lake, Human Computation

- **Big Systems**
  - IaaS, PaaS, SaaS, Microservices, SDN/NFV, API, SDK, AppEngine, and AppStore
  - Resource Management, HPC, GPU, FPGA, Emerging Architectures and Devices

- **Applications**
  - Analytics: Education, Game, IT, Legal, Industrial, Shareconomy, Social Networks
  - Business: E-commerce, CRM, Finance, Recommender, Risk, Search, Social
  - Health: Precision Medicine, Bioinformatics, Diagnosis, Genomics, Imaging, Agriculture
  - IoT: CPS, Mobile, Robotics, Autonomous Car, Smart City, Smart Sensing, Crowdsourcing
  - Security: Surveillance, Cybersecurity, Defense, Privacy, Reliability, Safety, Trust
  - Engineering: Aerospace, Auto, Chemical, Electrical, Environmental, Material, Mechanical

Member Benefits

- Creating intelligence through collective wisdom of industry, academia, and governments.
- Realizing a 10:1 return on investment.
- Enjoying royalty-free non-exclusive licensing of center intellectual property of all academic sites.
- Exploring intelligent platforms and services developed by the center.
- Leveraging the world-class talents (60+ professors and 200+ graduate students) in the era of big learning, big data, and big systems.
- Accessing top students in top universities.
- Joining peer members from high-profile companies and research units.

Membership

- The center membership fees are pooled to fund competitive research projects based on feedbacks from members.
- Members enjoy royalty-free non-exclusive licensing for intellectual property of all sites.
- Members have access to the entire center research portfolio, papers, software, and architectures.
- Members vote to select projects and set their funding levels.
- Semi-annual meetings are held in spring/fall for project selection and reporting.
- Full Member: $50,000 annual contribution, Associate (half member): $25,000.

Representative Projects

- DeepCloud, Intelligent Platform with Composable Building Blocks of Intelligent Models, Algorithms, Applications
- DeepLife, Intelligent Platform for IoT and Mobile Apps
- DeepHealth, Intelligent Algorithms and Models for Medical Diagnosis, Behavioral, Precision Medicine, Risk Analysis and Evaluation
- DeepEyes, Intelligent Transportation for Self-Driving, Collision Avoidance, Traffic Understanding and Navigation
- NELS, Never Ending Learning System about the World with Text, Images, and Video
- Interactive Learning, Feedback Driven Interactive Learning Framework
- DeepRecommender, Deep Learning based Recommender Systems for Activity, Business, and Entertainment
- DeepCompression, Media Content Compression, Deduplication and Genome Data Compression
- DeepSpectrum, Distributed Full Dimensional Spectrum Sensing with Compact Deep learning
- DeepRobot, Smart Robot with Full-Spectrum of Cognition for Actions and Automation and Services
- More Applications in analytics, business, health, IoT, Security, and Engineering

Center Contacts

- UF: Dr. Xiaolin Andy Li (andyli@ece.ufl.edu)
- UF: Dr. Jose Prieto (prieto@cel.clemson.edu)
- CMU: Dr. Ruslan Salakhutdinov (salakhru@cs.cmu.edu)
- CMU: Dr. Eric Xing (epxing@cs.cmu.edu)
- UO: Dr. Zhigang Dou (dou@cs.uoregon.edu)
- UO: Dr. Allen Malony (malony@cs.uoregon.edu)
- UMKC: Dr. Zhao Li (zhao@umkc.edu)
- UMKC: Dr. Yujung Lee (yjlee@umkc.edu)

The 4th Floor of NEB, 1064 Center Drive, Gainesville, FL 32611 | Office: 352-3922651 | Email: info@nsfcbcl.org | Homepage: http://www.nsfcbcl.org