



National Science Foundation Center for Big Learning

Creating Intelligence

National Science Foundation Industry & University Cooperative Research Center



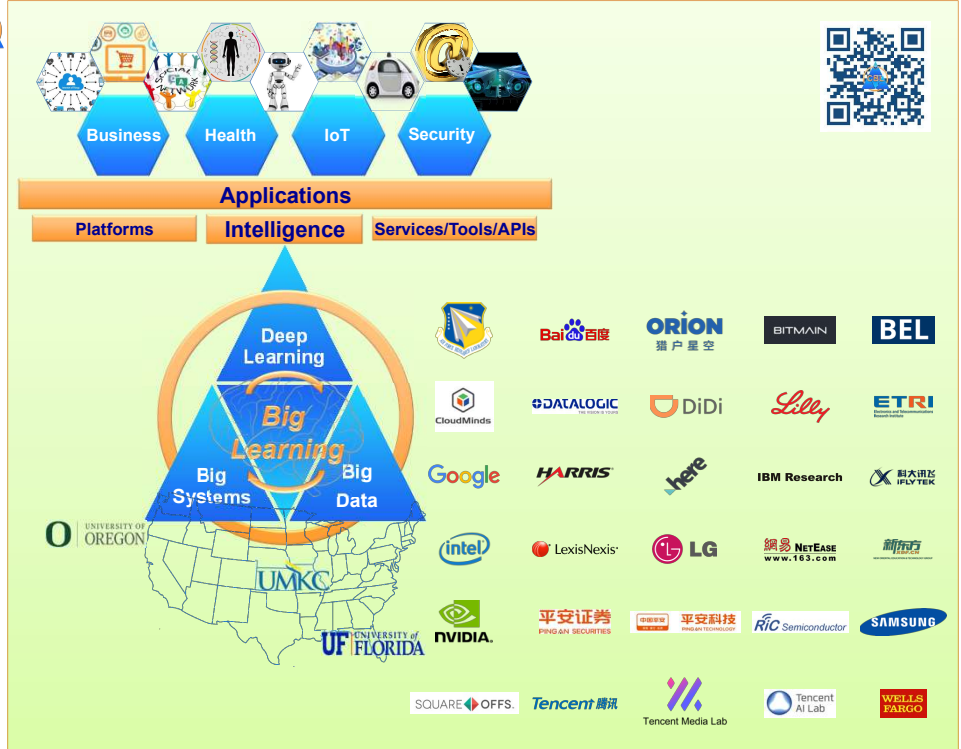
Vision: Creating intelligence towards intelligence-powered society.

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 intelligent platforms 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 three academic sites across the country and a large number (30+) of industry partners: [University of Florida \(UF, East\)](#), [University of Missouri at Kansas City \(UMKC, Central\)](#), and [University of Oregon \(UO, West\)](#). Faculty members (60+) at these three 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 Models and Algorithms**
 - Deep Architecture, DNN, DBN, CNN, RNN, LSTM, DRL, Brain-Inspired Algorithms
 - Generative Models, Adversarial Networks, Attention Models, Memory Networks, Neural Computers
 - Media (Image, Video, Speech, Text), Data (Business, Health, Life, Eng., Science)
- **Leveraging Conventional Machine Learning**
 - Supervised, Unsupervised, Reinforcement Learning, Graphical Models, Kernels
 - Learning Representation, Transfer Learning, Active Learning, Ensemble
- **Deep Learning Systems and Platforms**
 - DL Systems: Distributed Engine, SDK, API, Services
 - DL Platforms: Intelligent Platforms for Training, Inference, and Applications
- **Deep Learning Applications**
 - **Business:** E-commerce, CRM, Finance, Recommender, Risk, Surveillance, Security & Privacy
 - **Health:** Precision Medicine, Bioinformatics, Diagnosis, Genomics, Imaging, Agriculture
 - **IoT:** CPS, Mobile, Robotics, Autonomous Car, Smart City, Smart Sensing, Crowdsourcing



Member Benefits

- Creating intelligence through collective wisdom of industry, academia, and governments.
- Realizing a 10:1 return on investment. Leveraging financial support from NSF, universities, other members' contribution, and rich resources, a \$50,000 membership gets access to more than \$2,000,000 of research.
- 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 150+ 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 pre-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
- **DeepLite**, Intelligent Platform for IoT and Mobile Apps
- **CognitiveArchitecture**, Neural Cognitive Computing with Deep Memory, Deep Process, Deep Storage, and Interactive Crowdsourcing
- **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 and Actions for Automation and Services
- **More Algorithms**: Deep Reinforcement Learning, Deep Multi-Modal Generative Models, Deep Conventional Algorithms, Deep Attention Models, Deep Memory Networks, DL of DL, Deep Hybrid Architectures, Image Denoising, Object/Text/Pattern Recognition
- **More Applications** in analytics, business, health, IoT, Security, and Engineering

Center Contacts

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