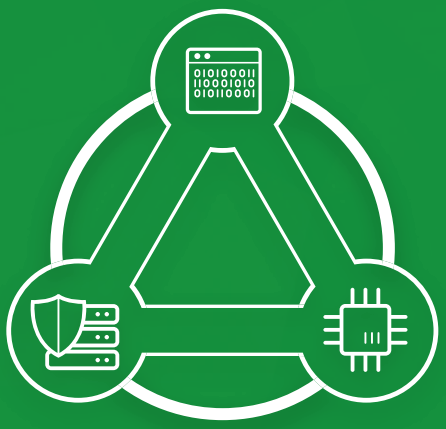
Center for
Machine-Integrated Computing & Security

UC San Diego
JACOBS SCHOOL OF ENGINEERING

WE INTEGRATE

HARDWARE, SOFTWARE, AI ALGORITHMS, AND DATA FOR SCALABLE MACHINE LEARNING AND SECURITY



SECURITY

HARDWARE ACCELERATION + SYSTEM-OPTIMIZATION ENGINES

REAL-TIME DATA ANALYTICS

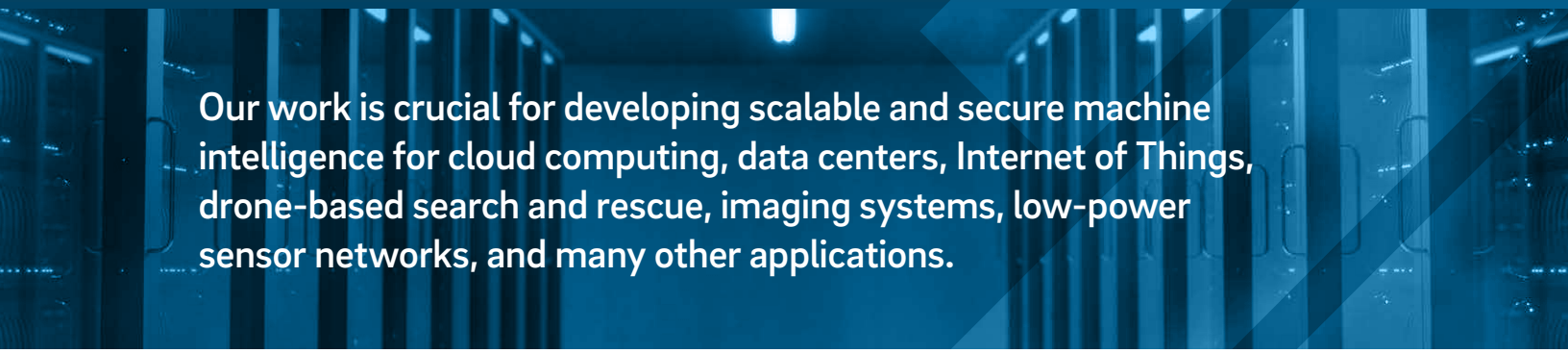
Hardware, software and algorithm co-design for real-time data analytics. Our customized performance optimization engine is automated and works across platforms, from low-power sensors to data centers and the cloud. Our solutions integrate adaptive data collection processes with training, learning, and inference in real-time and streaming applications.

PARADIGM SHIFT IN DEEP LEARNING

Automated acceleration and adaptive retraining of deep learning. Our framework allows for training of deep learning networks that are platform independent, and scale from sensors to mobile to data centers. We introduced a paradigm shift when we built and demonstrated the first training of deep learning on Edge devices.

SECURITY AND PRIVACY FOR CYBER-PHYSICAL SYSTEMS

To secure cyber-physical systems, we fully consider hardware, software, algorithms and data – and their isolation and interactions. We offer new approaches to security and privacy. Safe machine learning / defense against adversarial attacks, secure embedded medical devices, and privacy-preserving computing (DNA, learning, biometrics) are examples.



Our work is crucial for developing scalable and secure machine intelligence for cloud computing, data centers, Internet of Things, drone-based search and rescue, imaging systems, low-power sensor networks, and many other applications.

CENTER LEADERSHIP

Farinaz Koushanfar
Center Co-Director

Accelerated and domain-specific machine learning (ML), safe and secure ML, private ML, embedded and hardware systems, security and trust

Tara Javidi
Center Co-Director

Practical solutions with theoretical guarantees for information acquisition, processing, and communication

CENTER FACULTY

Ilkay Altintas
Makes computational data science more reusable, scalable and reproducible through methods and tools for workflows for problem solving

Kamalika Chaudhuri
Trustworthy machine learning, learning and active learning theory

Pamela Cosman
Image and video compression, processing, and wireless communications

Hadi Esmaeilzadeh
Immersive machine intelligence, full-stack solutions

Andrew Kahng
Physical design of VLSI

Ryan Kastner
Embedded security, hardware and FPGA acceleration; FPGAs; reconfigurable computing

Duygu Kuzum
In-memory computing with emerging non-volatile memory devices, neuromorphic computing, brain interfaces

Siavash Mirarab
Scalable analysis of large-scale biological datasets

Truong Nguyen
Image and video processing on low-power, low-cost systems

Alon Orlitsky
Estimation, learning, and speech processing

Piya Pal
High dimensional statistical signal processing, high resolution imaging

Bhaskar Rao
Signal processing, estimation theory, speech processing

Tajana Simunic Rosing
Embedded system design and software optimization, power management

Deian Stefan
Systems, security, and programming languages

Behrouz Touri
Dynamics and controls over complex networks, distributed optimization and computation

Nuno Vasconcelos
Statistical signal processing, computer vision, machine learning, multimedia

Jishen Zhao
Memory and storage architecture and systems, domain-specific acceleration, software/hardware co-design

BENEFITS OF PARTNERSHIP

- Develop Masters and PhD talent pipeline
- Partner-only recruiting events
- Industry-faculty-student research teams
- Embed a Visiting Industry Fellow
- Influence research priorities
- First look at new discoveries
- Research portfolio management
- Center Advisory Board membership
- Fast-track research agreements
- Research Summits, workshops, and more

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CONTACT

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