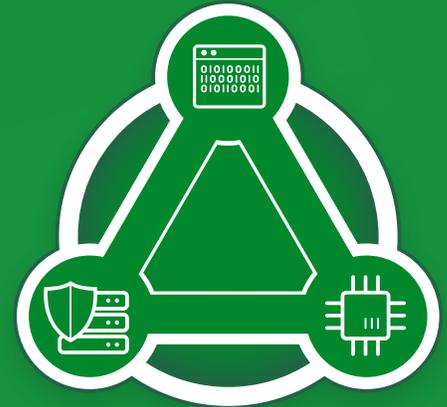


# WE INTEGRATE

**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

### Nicholas Antipa

Computational optical imaging systems design

### 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

### Mingu Kang

Software-hardware co-design, circuits

### 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

### Hanh-Phuc Le

Integrated/miniaturized power electronics, delivery, and management for all

### Siavash Mirarab

Scalable analysis of large-scale biological datasets

### Imani N.S. Munyaka

Issue identification and solution testing to improve the human experience with security and privacy-related tools

### 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

### Yuanyuan Shi

Data-driven control, energy systems and cyber-physical systems

### 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

### Yatish Turakhi

Algorithms and hardware-accelerators for computational biology

### Nuno Vasconcelos

Statistical signal processing, computer vision, machine learning, multimedia

### Lily Weng

Robust, safe and trustworthy Machine Learning, uncertainty quantification, robust optimization of system design

### Rose Yu

Large-scale spatiotemporal learning, deep learning, tensor methods, and their applications

### 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

## CONTACT

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