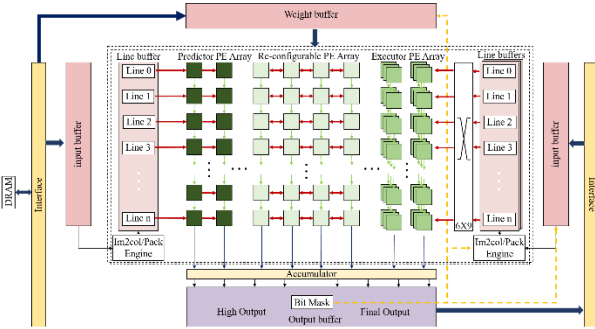# Dr. Song Fu (Professor)

Department of Computer Science and Engineering

Professor, Associate Chair for Research
Site Director, NSF IUCRC Center for Electric, Connected and Autonomous Technologies for Mobility (eCAT)
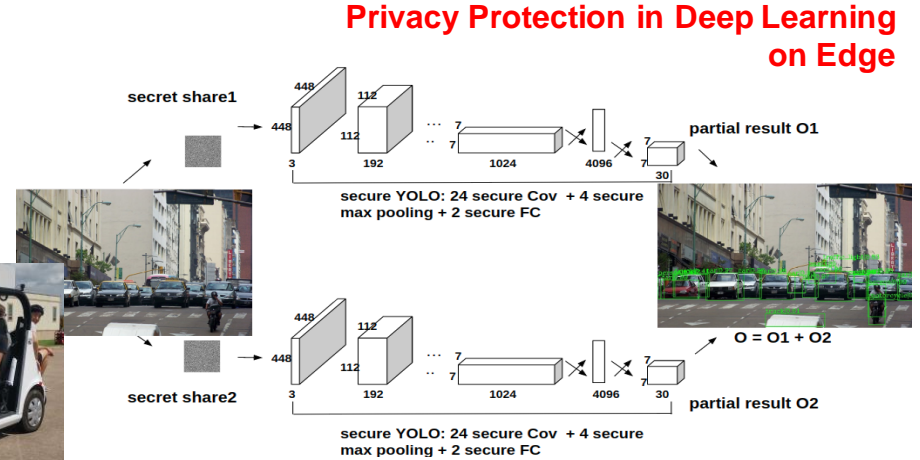Intelligent systems, Edge and cloud computing, Machine learning, Autonomous vehicles, Storage systems
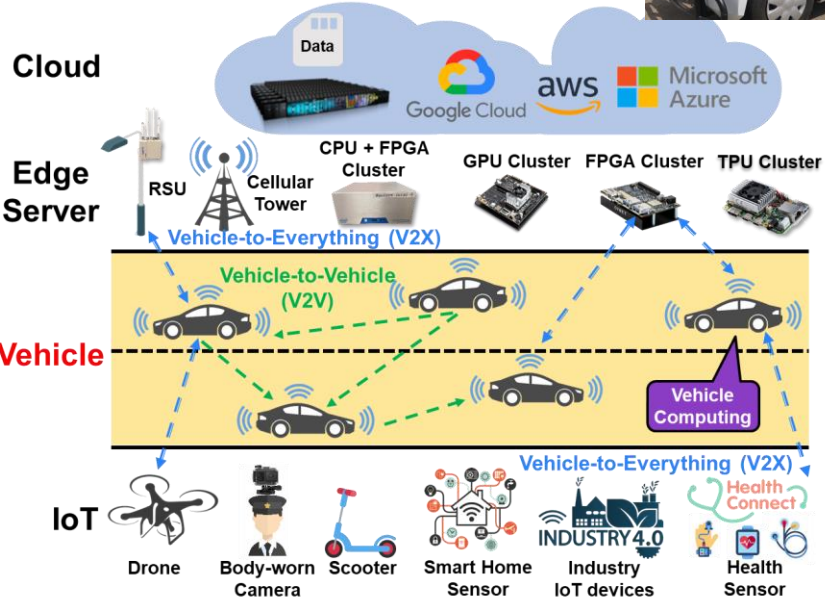**Federal and Industrial funding; 7 Ph.D. Students**

Deep Learning Acceleration

Privacy Protection in Deep Learning on Edge

secret share1

secret share2

448 112   7   7 partial result O1
448 112
3   192   1024 4096 30

secure YOLO: 24 secure Cov + 4 secure max pooling + 2 secure FC

448 112   7
448 112
3   192   1024 4096 30

O = O1 + O2

partial result O2

secure YOLO: 24 secure Cov + 4 secure max pooling + 2 secure FC

Vehicle and Edge Computing

Deep Learning for Additive Manufacturing – In-situ detection

Encoder Layers   Decoder Layers

Cloud

Data   Google Cloud   aws   Microsoft Azure

Edge Server

RSU   Cellular Tower   CPU + FPGA Cluster   GPU Cluster   FPGA Cluster   TPU Cluster

Vehicle-to-Everything (V2X)

Vehicle-to-Vehicle (V2V)

Vehicle

Vehicle Computing

Vehicle-to-Everything (V2X)

layer thickness d_L

IoT

Drone   Body-worn Camera   Scooter   Smart Home Sensor   Industry IoT devices   Health Sensor

INDUSTRY 4.0   Health Connect

NSF   DEPARTMENT OF ENERGY   Los Alamos NATIONAL LABORATORY EST. 1943   TOYOTA   FUJITSU