

CAPP

컴퓨터 구조 및 병렬처리 연구실



Professor
이혁재

- B.S. in EE from SNU
- M.S. in EE from SNU
- Ph.D. in ECE from Purdue Univ.
- Assistant Prof, Louisiana Tech University, USA (1996~1998)
- Senior Engineer, Intel, USA (1998~2001)
- Chair, Department of Electrical and Computer Engineering, SNU (2019 ~2023)
- Present Professor, SNU(2001~)

현황



31 Ph.D. candidates
16 M.S. candidates



30 Ph.D. graduates
52 M.S. graduates



Int'l Journal 30
Int'l Conference 45
(recent 3 years)

Projects



Projects
(recent 3 years)

- PIM for Recommendation System
- Scalable Multi-chip AI Accelerator
- Robust AI System
- Variable-precision deep learning technology for high-speed multiple object tracking
- Type-3 CXL AIC Memory Optimization for NLP
- Multi-view Object Detection
- etc.

Contact

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Class

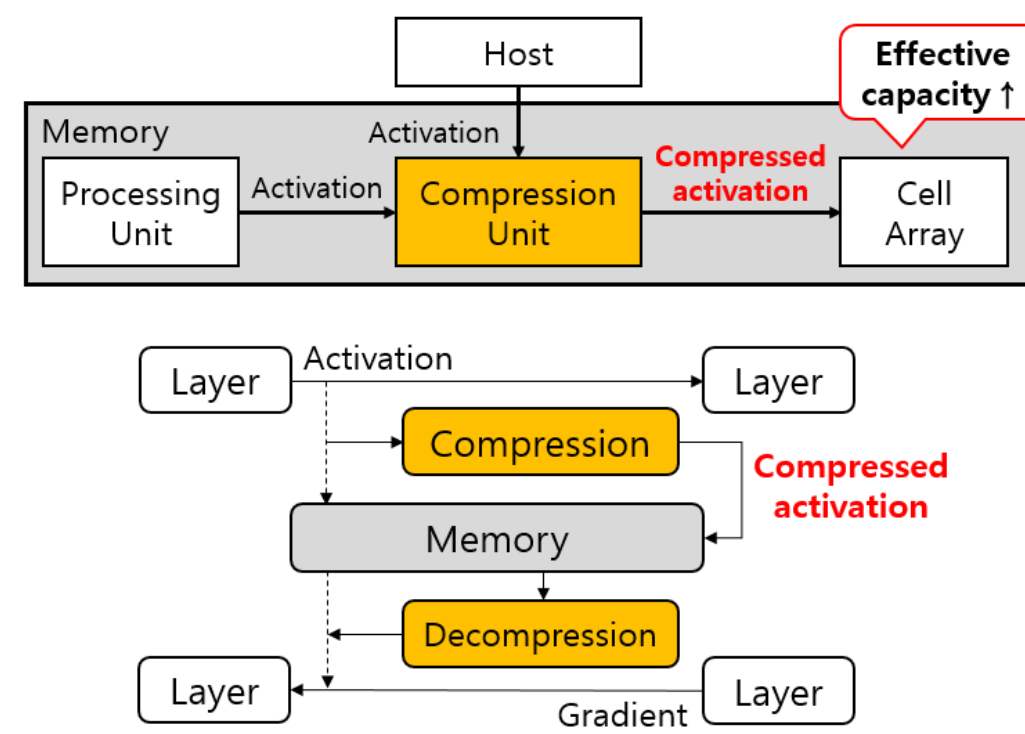
Pre-requisite : 디지털 시스템 설계 및 실험, 논리설계 및 실험
Optional : 임베디드시스템설계, 알고리즘의 기초, 컴퓨터조직론

연구 분야 소개

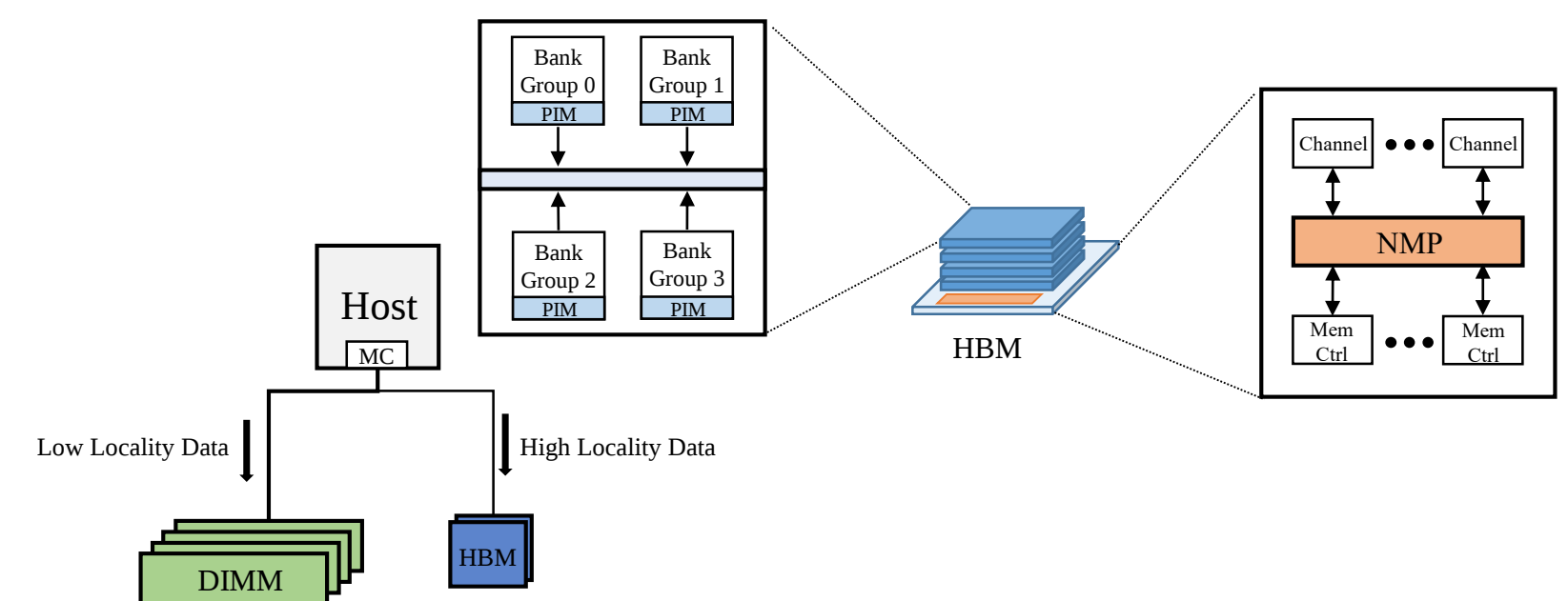
컴퓨터 구조 | 반도체 설계 | 딥러닝 이미지 프로세싱

Computer Architecture & Memory

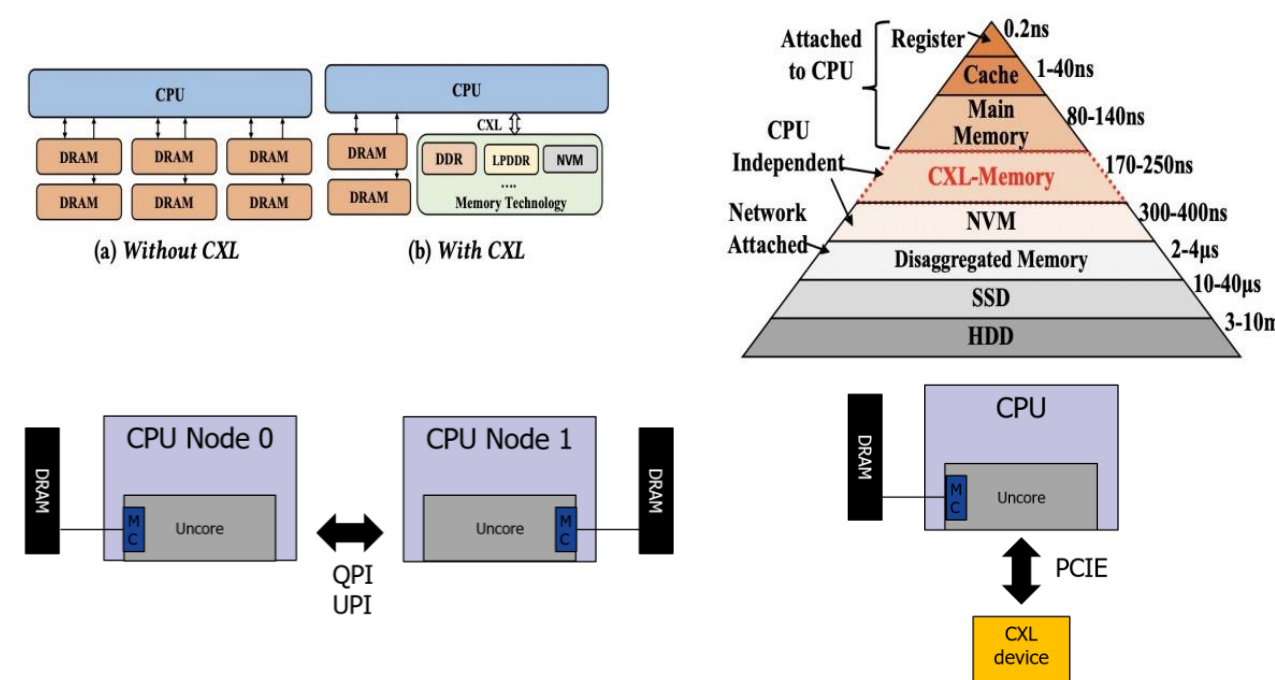
In-Memory Activation Compression



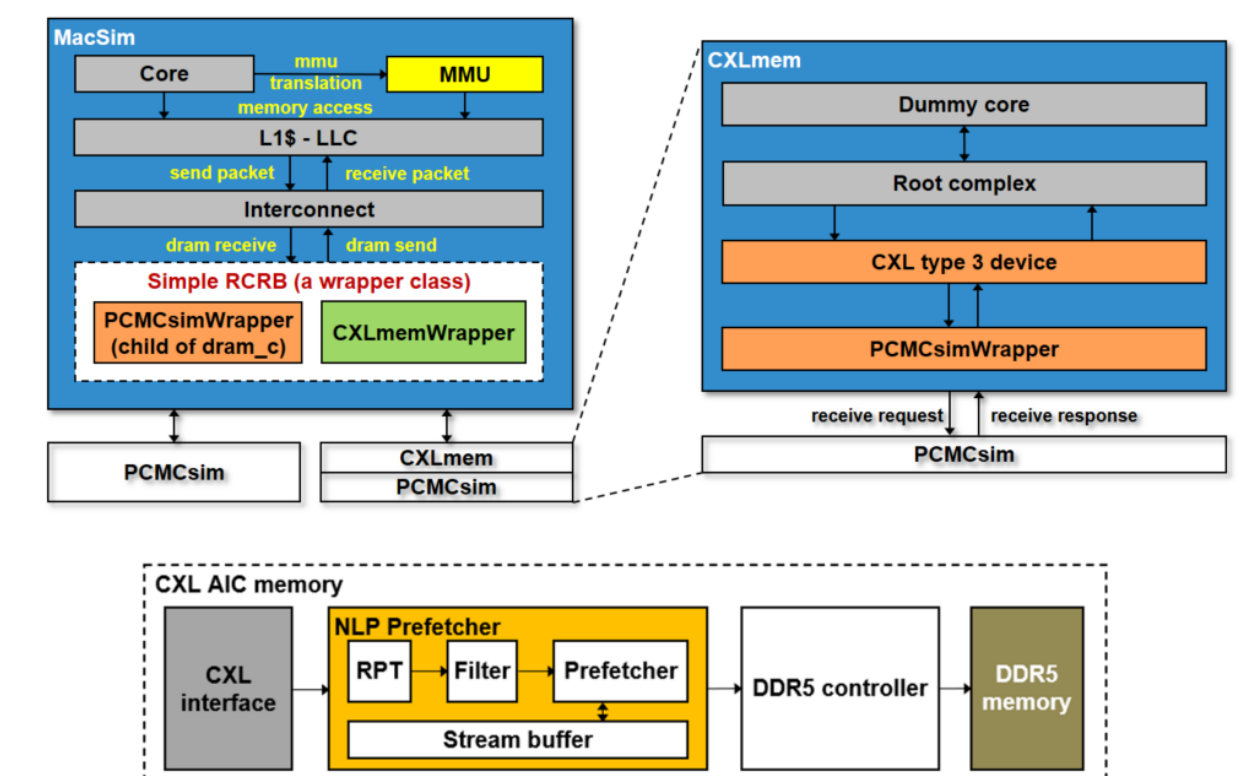
Processing-In-Memory for Recommendation System



Workload Acceleration using CXL



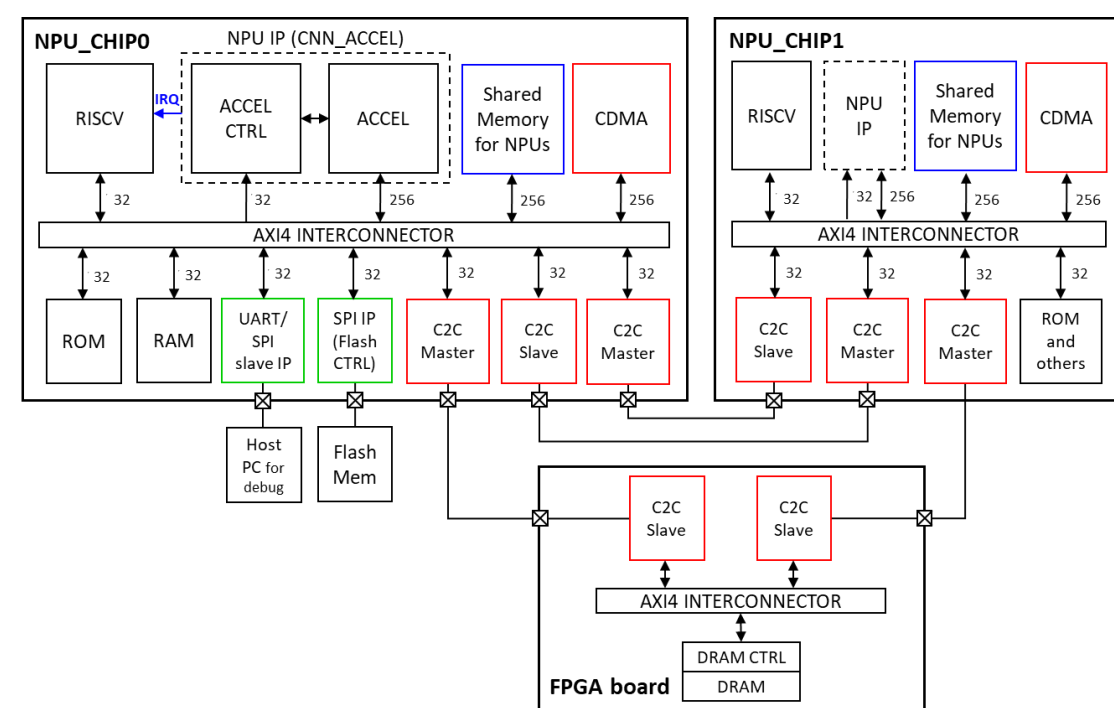
Type-3 CXL AIC Memory Optimization for NLP



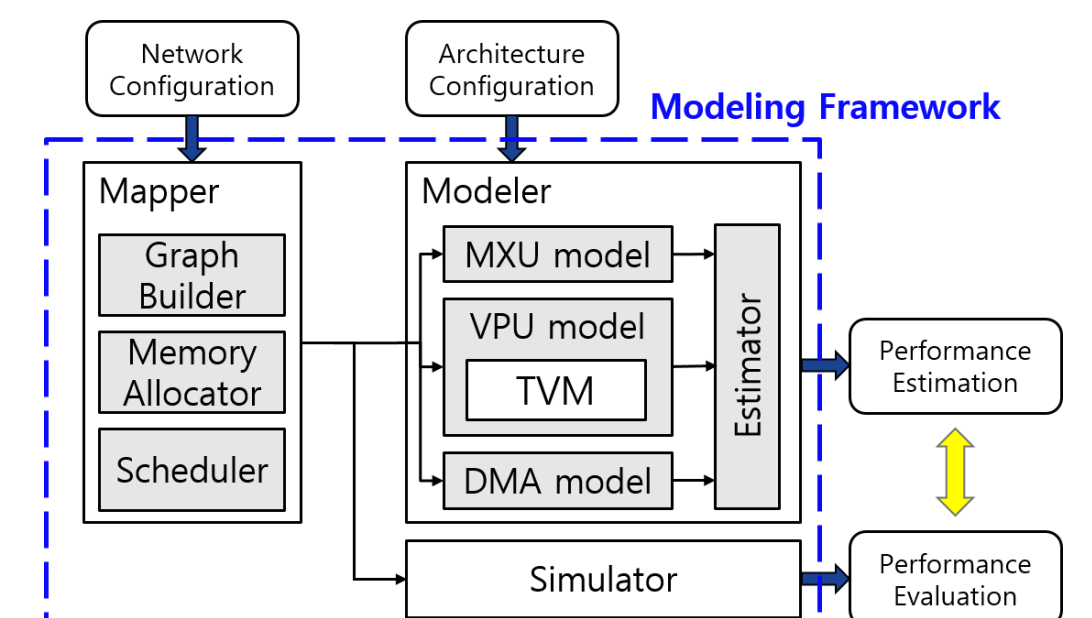
- PIM을 사용하여 recommendation system, LLM 등의 AI workload 가속을 위한 연구
- CXL 프로토콜을 활용하여 memory intensive workload 가속 및 메모리 최적화 방법 연구
- PIM과 NPU를 동시 지원하는 고효율 컴파일러 개발

SoC(System-on-Chip) Design

Scalable Multi-ship AI Accelerator



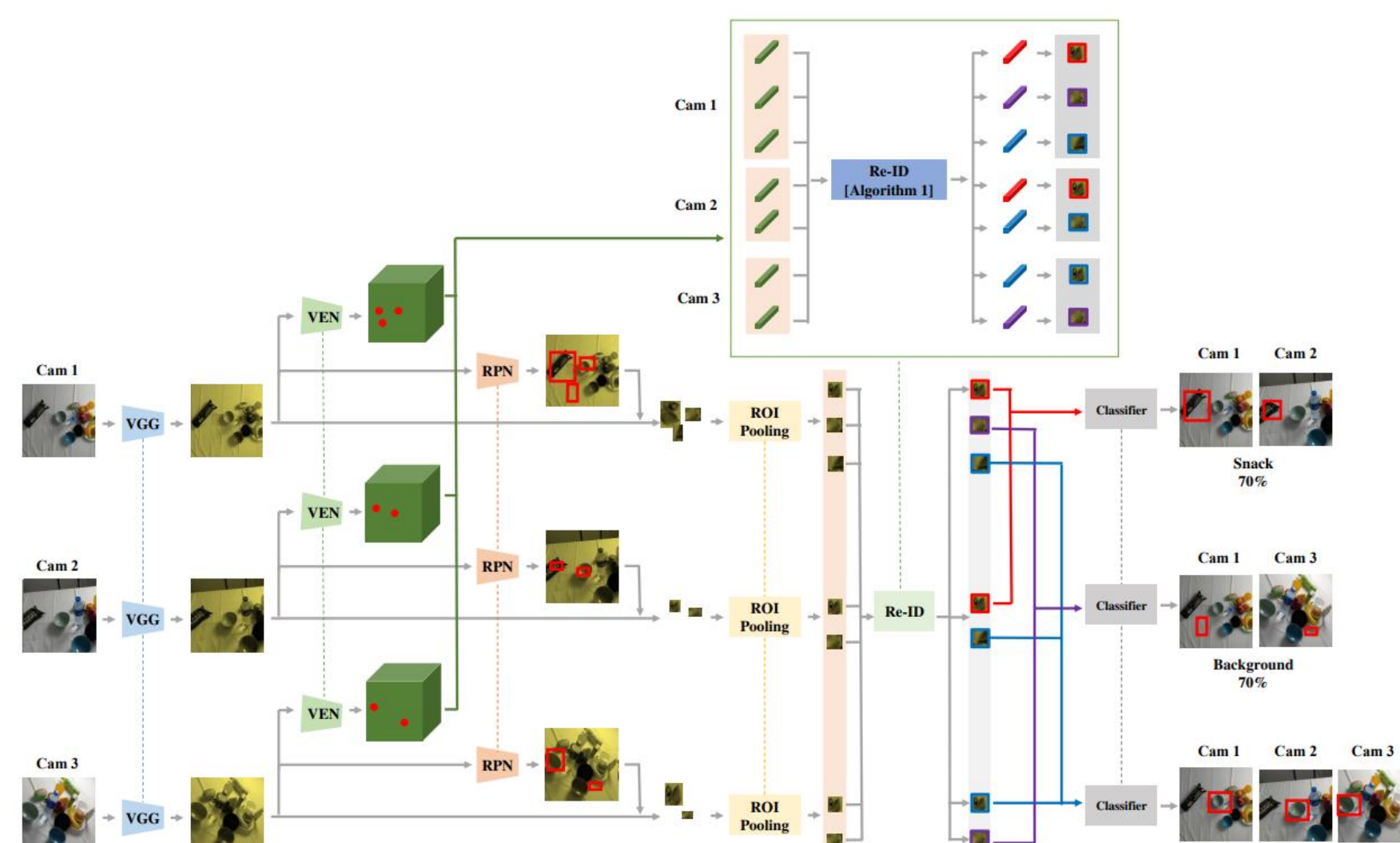
Performance Modeling Framework of AI Accelerator



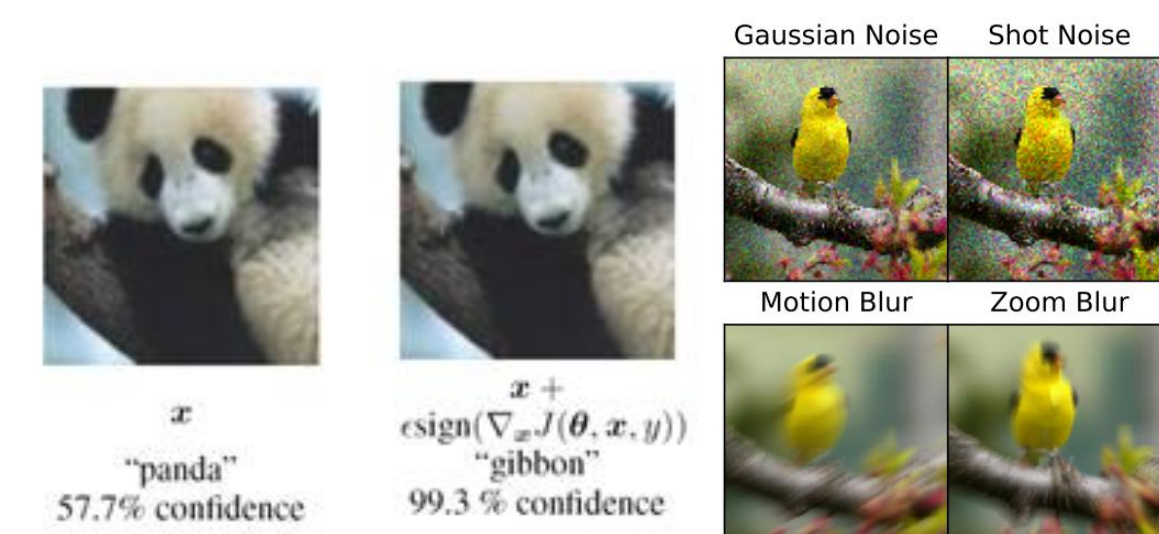
- AI application을 여러 개의 chip으로 나누어 가속하는 scalable AI accelerator 설계
- AI accelerator의 성능을 예측할 수 있는 modeling framework 개발
- 가변 정밀도 연산을 지원하는 고성능 고효율 신경망 추론 가속기 IP 개발

Deep Learning based Image Processing

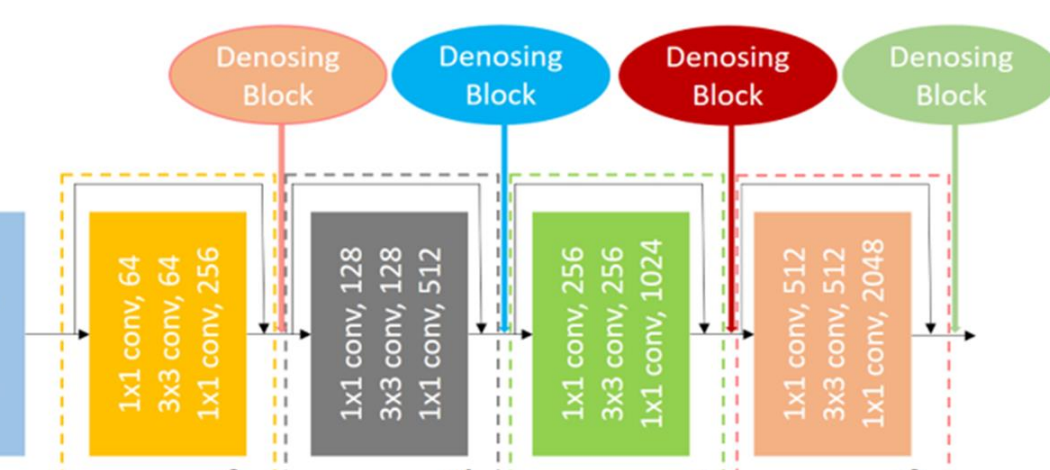
Multi-View Object Detection



Robust AI System



<Adversarial Robustness> <Corruption Robustness>



< Robust Feature Denoising Network >

- 무인 점포를 위한 Multi-View Object Detection 알고리즘 개발
- Model Robustness 개선을 위한 data augmentation 기법 및 network architecture 연구