

- Neuromorphic Computing
- Machine Learning
- Computer Vision

## RESEARCH INTERESTS

My research aims to build more *bio-inspired* machine intelligence where the system can achieve both energy-efficiency and robust performance. I develop the learning algorithms which facilitate binary communication (like the human brain) in AI systems, while having hardware-friendly features. Also, I look into various tasks, such as distributed learning and domain adaptation, enabling learning systems to tackle real-world scenarios.

## EDUCATION

<b>Ph.D. student, Electrical Engineering</b> , Yale University [Advisor: Prof. Priyadarshini Panda]	<b>Sep. 2020 — Current</b>
<b>M.S., Electrical Engineering</b> , Korea Advanced Institute of Science and Technology (KAIST)	<b>Mar. 2018 — Feb. 2020</b>
<b>B.S., Electrical Engineering</b> , Sogang University	<b>Mar. 2012 — Feb. 2018</b>

## EXPERIENCE

<b>Neuromorphic algorithm research internship</b> Samsung Advanced Institute of Technology (SAIT)	<b>Jun. 2021 — Aug. 2021</b> South Korea
<b>AI research internship</b> SK-Tbrain	<b>Jan. 2020 — July. 2020</b> South Korea
<b>AI research internship</b> Kakao Corporation	<b>June. 2019 — Sep. 2019</b> South Korea

## PUBLICATIONS [CONFERENCE]

- Kim, Y.**, Li, Y. Park, H., Venkatesha, Y., Yin, R., and Panda, P., *Lottery Ticket Hypothesis for Spiking Neural Networks*. **Oral Presentation (2.7% of submitted papers)**, Accepted to European Conference on Computer Vision (ECCV) 2022.
- Kim, Y.**, Li, Y. Park, H., Venkatesha, Y., and Panda, P., *Neural Architecture Search for Spiking Neural Networks*. Accepted to European Conference on Computer Vision (ECCV) 2022.
- Li, Y., **Kim, Y.**, Park, H., and Panda, P., *Neuromorphic Data Augmentation for Training Spiking Neural Networks*. Accepted to European Conference on Computer Vision (ECCV) 2022.
- Bhattacharjee, A.\* , **Kim, Y.\***, Moitra, A., and Panda, P. Examining the Robustness of Spiking Neural Networks on Non-ideal Memristive Crossbars. Accepted in ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED) (2022), **Best Paper**. (\* equal contribution)
- Kim, Y.**, Park, H., Moitra, A., Bhattacharjee, A. , Venkatesha, Y., and Panda, P. Rate Coding Or Direct Coding: Which One is Better for Accurate, Robust, and Energy-efficient Spiking Neural Networks?. Accepted in IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (2022).
- Kim, Y.**, Kim, H., Kim, S., Kim, S. J., & Panda, P. *Gradient-based Bit Encoding Optimization for Noise-Robust Binary Memristive Crossbar*. Accepted in Design, Automation and Test in Europe Conference (DATE) (2022).
- Kim, Y.**, Venkatesha, Y., & Panda, P. , *PrivateSNN: Privacy-Preserving Spiking Neural Networks*. AAAI Conference on Artificial Intelligence (AAAI) (2022).
- Choi, S., Lee, S., **Kim, Y.**, Kim, T., & Kim, C. *Hi-cmd: Hierarchical cross-modality disentanglement for visible-infrared person re-identification*. IEEE/CVF conference on computer vision and pattern recognition (CVPR) (2020).
- Kim, Y.**, Kim, S., Kim, T., & Kim, C. *Cnn-based semantic segmentation using level set loss*. IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) (2020).
- Kim, Y.**, Choi, S., Lee, H., Kim, T., & Kim, C. *RPM-Net: Robust Pixel-Level Matching Networks for Self-Supervised Video Object Segmentation*. IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) (2020).
- Yang, S., Kim, Y., **Kim, Y.**, & Kim, C. *Combinational class activation maps for weakly supervised object localization* IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) (2020).
- Lee, H., Choi, S., **Kim, Y.**, & Kim, C. *Bilinear Siamese Networks with Background Suppression for Visual Object Tracking*. British Machine Vision Conference (BMVC) (2019).

## PUBLICATIONS [JOURNAL]

---

Christensen, D.V., et al. "2022 roadmap on neuromorphic computing and engineering." Neuromorphic Computing and Engineering (2022).

**Kim, Y.,** & Panda, P., *Revisiting batch normalization for training low-latency deep spiking neural networks from scratch* Frontiers in Neuroscience (2021).

**Kim, Y.** & Panda, P., *Visual explanations from spiking neural networks using interspike intervals*. Nature Scientific Reports 11(2021).

**Kim, Y.** & Panda, P., *Optimizing Deeper Spiking Neural Networks for Dynamic Vision Sensing*. Neural Networks-Elsevier(2021).

Venkatesha, Y., **Kim, Y.**, Tassiulas, L., & Panda, P., *Federated Learning with Spiking Neural Networks*. IEEE Transactions on Signal Processing(2021).

**Kim, Y.**, Cho, D., Han, K., Panda, P., & Hong, S, *Domain adaptation without source data*. IEEE Transactions on Artificial Intelligence(2021).

Bhattacharjee, A., Bhatnagar, L., **Kim, Y.**, & Panda, P., *NEAT: Non-linearity Aware Training for Accurate, Energy-Efficient and Robust Implementation of Neural Networks on 1T-1R Crossbars*. IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems(2021).

**Kim, Y.**, & Hong, S, *Adaptive Graph Adversarial Networks for Partial Domain Adaptation*. IEEE Transactions on Circuits and Systems for Video Technology(2021).

**Kim, Y.**, Cho, D., & Hong, S, *Towards Privacy-Preserving Domain Adaptation*. IEEE Signal Processing Letters (2020).

## PUBLICATIONS [TECHNICAL REPORTS]

---

Moitra, A., **Kim, Y.**, and Panda, P., *Adversarial Detection without Model Information*. arXiv preprint arXiv:2202.04271 (2022).

Venkatesha, Y., **Kim, Y.**, Park, H., Li, Y., and Panda, P., *Addressing Client Drift in Federated Continual Learning with Adaptive Optimization*. arXiv preprint arXiv:2203.13321 (2022).

Yin, R., Moitra, A., Bhattacharjee, A., **Kim, Y.**, and Panda, P., *SATA: Sparsity-Aware Training Accelerator for Spiking Neural Networks*. arXiv preprint arXiv:2204.05422 (2022).

## TEACHING EXPERIENCE

---

- EENG 348, Digital Systems, 2022

## ACADEMIC ACTIVITIES

---

### Reviewer

- European Conference on Computer Vision (ECCV), 2022
- IEEE/CVF conference on Computer Vision and Pattern Recognition (CVPR), 2021
- IEEE Transactions on Pattern Analysis and Machine Intelligence(TPAMI)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- IEEE Transactions on Multimedia (TMM)
- IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)