

## Education

- **SZU (Shenzhen University) - Computer Vision Institute** Shenzhen, China  
*M.S. in Computer Science* June. 2019 - July. 2022  
– Research Interests: Adversarial Learning & Self-supervised Learning
- **KAUST - AI Initiative** Saudi Arabia  
*PhD in Computer Science under the supervision of Juergen Schmidhuber* Aug. 2022 - Present  
– Research Interests: Video-based Decision System & Sequence Modelling

## Selected Publications

1. **Liu, H.**, W Zhang, Li, B., Wu, H., He, N., Huang, Y., Li, Y., Ghanem, B. & Zheng, Y. AdaptiveMix: Improving GAN Training via Feature Space Shrinkage. CVPR'2023 [\[pdf\]](#)[\[code\]](#)
2. **Liu, H.**, Li, B., Wu, H., Liang, H., Huang, Y., Li, Y., ... & Zheng, Y. Combating Mode Collapse in GANs via Manifold Entropy Estimation. AAAI'2023 [\[pdf\]](#) [\[code\]](#)
3. **Liu, H.**, Wu, H., Xie, W., Liu, F., & Shen, L. (2021). Group-wise Inhibition-based Feature Regularization for Robust Classification. ICCV'2021 [\[pdf\]](#) [\[code\]](#)
4. **Liu, H.**, Zhang, W., Liu, F., Wu, H., & Shen, L. Fingerprint Presentation Attack Detector Using Global-Local Model. IEEE T-Cybernetics. [\[pdf\]](#) [\[code\]](#)
5. **Liu, H.**, Zhang, W., Xie J., Wu, H., Li, B., Zhang, Z., Li, Y., Huang, Y., Ghanem, B., Y. Zheng. Decoupled Mixup for Out-of-Distribution Visual Recognition. ECCV'2022 Workshop [\[pdf\]](#) [\[code\]](#)
6. Zhang W., **Liu, H.**, Liu, F., Ramachandra, R., & Busch, C. Effective Presentation Attack Detection Driven by Face Related Task. ECCV'2022 (**Equal Contribution**) [\[pdf\]](#) [\[code\]](#)
7. Ji, H., **Liu, H.** Li, Y., Xie, J., He, N., Huang, Y., Dong, W., Chen, X., Shen, L., Zheng, Y. (2022) Point Beyond Class: A Benchmark for Weakly Semi-Supervised Abnormality Localization in Chest X-Rays. MICCAI'2022. (**Equal Contribution**) [\[pdf\]](#) [\[code\]](#)
8. Wu, H., Chen, K., **Liu, H.**, Zhuge, M., B Li, ... , & Ghanem, B. NewsNet: A Novel Dataset for Hierarchical Temporal Segmentation CVPR'2023. (**Equal Contribution**) [\[code\]](#)
9. Liu, F., **Liu, H.**, Zhang, W., Liu, G., & Shen, L. (2021). One-Class Fingerprint Presentation Attack Detection Using Auto-Encoder Network. IEEE T-IP, 30, 2394-2407. [\[pdf\]](#)
10. Wu, H., Chen, K., Luo, Y., Qiao, R., Ren, B., **Liu, H.**, Xie, W., Shen, L. (2022) Scene Consistency Representation Learning for Video Scene Segmentation. CVPR'2022. [\[pdf\]](#)[\[code\]](#)

## Awards, Grants & Honors

|   |      |
|---|------|
| Outstanding Graduate Award ( <b>Rate</b> $\leq$ <b>5%</b> )                               | 2022 |
| China National Scholarship ( <b>Rate</b> $\leq$ <b>0.02%</b> )                            | 2021 |
| Excellent Academic Scholarship, First Class   | 2020 |
| Excellent Academic Scholarship, Second Class  | 2019 |
| National University Big Data Application Innovation Competition in Northwest, First Place | 2018 |
| National University Big Data Application Innovation Competition, Second Place             | 2018 |
| Excellent Graduation Design (Thesis) of SUST, Best Undergraduate Thesis                   | 2018 |

## Research Experience

- **AI Initiative (KAUST)** Saudi Arabia  
*PhD Candidate supervised by Prof. Juergen Schmidhuber and Prof. Bernard Ghanem* 2022 - Present
  - Research Field includes Video-based Decision System, Subgoal Extraction
  - Joined the Project, Highway RL, to design a novel multi-step Value Iteration method with exponential contraction rate but only linear computational complexity
- **Jarvis Lab (Tencent)** Shenzhen, China  
*Internship supervised by Mentor: N. He & Y. Li and Director: Y. Zheng* 2021 - Present
  - Proposed AdaptiveMix to improve GAN training, which is accepted by **CVPR'2023**. (This project cooperates with AI Initiative, KAUST)
  - Proposed offline entropy estimation to combat mode collapse, which is accepted **AAAI'2023**. (This project cooperates with AI Initiative, KAUST.)
  - Proposed Point Beyond Class to reduce the annotation cost for medical object detection, which is accepted by **MICCAI'2022**
  - Participate to NICO Challenge (ECCV'2022 workshop), our team reach to 5th/40 in both tracks at Phase I.
- **Norwegian Biometrics Laboratory (NTNU)** Gjøvik, Norway  
*Visiting Student supervised by Prof. C. Busch and Prof. R. Ramachandra* 2021 - 2022
  - Proposed a self-supervised learning based method for face and fingerprint presentation attack detection, which is accepted **IEEE TNNLS**.
  - Proposed a face presentation attack detector based on the taskonomy features, which is accepted by **ECCV' 2022**.
- **Computer Vision Insitute (SZU)** Shenzhen, China  
*Member in Biometrics Group supervised by Prof. F. Liu and Prof. L. Shen* 2019 - 2022
  - Proposed a regularization method to improve the robustness of CNN based models, which is accepted by **ICCV'2021** and open source.
  - Proposed a Manifold-preserved GANs to mitigate the mode collapse and gradient exploding.
  - Collected a famous presentation attack dataset based on OCT and for **the first time** established a one-class framework for OCT-based PAD. This work is accepted by **IEEE TIP**
  - Proposed a presentation attack detector using Global-Local model, which reaches over 90% in terms of TDR@FDR=1% on LivDet2017 for **the first time** (Accepted by **IEEE TCYB**)