Chaoning Zhang – Curriculum Vitae

Basic Information

Status: Assistant professor at Kyung Hee University
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Short profile

I am currently an assistant professor at Kyung Hee University. Prior to that, I worked under the supervision of Professor In So Kweon at KAIST. My research interest lies in the intersection between machine learning (ML) and computer vision (CV). With CV as a testbed, I have investigated various ML topics for data-efficient yet robust AI. By focusing on the fundamental generalization problem in ML, my ultimate goal is to bridge the gap between real-world problems in industry and AI solutions in academia. My research domain includes (but is not limited to) the following topics: (1) mode robustness (adversarial attack/defense), (2) data efficiency (self-supervised learning), (3) generative AI (AIGC). I obtained **Qualcomm Innovation Felowship** (Korea) in 2020. In the past three years, I have published around **30 first or co-first author** papers, including CVPR, ICCV, ECCV (Oral), NeurIPS, ICLR, AAAI, IJCAI, ACM MM, etc.

Education and Work

2022.9 - Now	Assistant professor, - *Kyung Hee Univeristy (QS 2022 world ranking: 264)*
2021.9 - 2022.8	Post-doctoral Researcher, - *KAIST*
2018.2 - 2021.8	PhD, Electrical Engineering - *KAIST (QS 2022 world ranking: 42)*
2015.8 - 2018.2	Engineer (Seoul) - LS Electric (previously known as LG Industrial System), Korea
2012.8 - 2015.7	Ms, Engineering & Policy Analysis, TU Delft (Netherlands) Ms, Electrical Engineering, Harbin Institute of Technology (HIT), China
2008.8 - 2012.7	Bs, Electrical Engineering - Harbin Institute of Technology (HIT), China

Two Ms degrees: I attended a dual master degree program between HIT (China) and TU Delft (Netherlands).

Honors and Awards

• **Outstanding paper award** at CVPR2021 workshop on AML-CV
• CVPR2021 Security AI Challenger VI Competition（Unrestricted Adversarial Attacks on ImageNet）
Our team was ranked **4th in more than 1500 teams** (Organized by Alibaba and Tsinghua University)
• **Qualcomm Innovation Fellowship** (Korea), 2020
• Korean Speech Competition Award (ranking 2nd), KAIST, 2018
• Excellent Master Graduate (top 5%), Harbin Institute of Technology, 2015

Language skills

• Chinese, native
• English (IELTS 8/9), work language
• Korean, TOPIK 6 (highest level), advanced level
• Japanese, JLPT N1 (highest level), advanced level

Recent publication ([†] indicates co-first authorship)

Selected 10 recent papers (from 2020 to 2022)

1. **Chaoning Zhang**[†], Kang Zhang[†], Chenshuang Zhang, Axi Niu, Jiu Feng, Chang D. Yoo, In-So Kweon, "Decoupled Adversarial Contrastive Learning for Self-supervised Adversarial Robustness", **ECCV 2022. Oral (2.7% acceptance rate)**

2. **Chaoning Zhang**, Philipp Benz, Adil Karjauv, Jae Won Cho, Kang Zhang, In-So Kweon, "Investigating Top-k White-Box and Transferable Black-box Attack", **CVPR 2022**.

3. **Chaoning Zhang**[†], Kang Zhang[†], Trung X. Pham[†], Axi Niu, Zhinan Qiao, Changdong Yoo, In-So Kweon, "Dual Temperature Helps Contrastive Learning Without Many Negative Samples: Towards Understanding and Simplifying MoCo", **CVPR 2022**.

4. **Chaoning Zhang**[†], Kang Zhang[†], Chenshuang Zhang, Trung X. Pham, Changdong Yoo, In-So Kweon, "How Does SimSiam Avoid Collapse Without Negative Samples? A Unified Understanding with Self-supervised Contrastive Learning", **ICLR 2022**.

5. **Chaoning Zhang**[†], Philipp Benz[†], Adil Karjauv[†], In-So Kweon, "Data-Free Universal Adversarial Perturbation and No-Box Attack", **ICCV 2021**.

6. **Chaoning Zhang**[†], Philipp Benz[†], Adil Karjauv, In-So Kweon, "Universal Adversarial Perturbations Through the Lens of Deep Steganography: Towards a Fourier Perspective", **AAAI 2021**.

7. **Chaoning Zhang**[†], Philipp Benz[†], Chenguo Lin[†], Adil Karjauv, Jing Wu, In-So Kweon, "A Survey on Universal Adversarial Attack", **IJCAI 2021**.

8. **Chaoning Zhang**[†], Philipp Benz[†], Tooba Imtiaz, In So Kweon, "Understanding Adversarial Examples from the Mutual Influence of Images and Perturbations", **CVPR 2020**.

9. **Chaoning Zhang**[†], Philipp Benz[†], Adil Karjauv[†], Geng Sun, In-So Kweon, "UDH: Universal Deep Hiding for Steganography, Watermarking, and Light Field Messaging", **NeurIPS 2020**.

10. **Chaoning Zhang**[†], Philipp Benz[†], Tooba Imtiaz, In-So Kweon, "CD-UAP: Class Discriminative Universal Adversarial Perturbations", **AAAI 2020**.

Other recent papers

1. Philipp Benz[†], **Chaoning Zhang**[†], Adil Karjauv, In-So Kweon, "Batch Normalization Increases Adversarial Vulnerability and Decreases Adversarial Transferability: A feature perspective", **ICCV 2021**.

2. **Chaoning Zhang**[†], Adil Karjauv[†], Philipp Benz[†],In-So Kweon, "Towards Robust Deep Hiding Under Non-Differentiable Distortions for Practical Blind Watermarking", **ACM Multimedia 2021**.

3. **Chaoning Zhang**[†], Philipp Benz[†], Dawit Mureja Argaw, Seokju Lee, Junsik Kim, Francois Rameau, Jean-Charles Bazin, In So Kweon, ResNet or DenseNet: Introducing Dense Shortcuts to ResNet, **WACV 2021**.

4. **Chaoning Zhang**, Francois Rameau, Junsik Kim, Dawit Mureja Argaw, Jean-Charles Bazin, and In So Kweon, "DeepPTZ: Deep Self-Calibration for PTZ Cameras", **WACV 2020**.

5. **Chaoning Zhang**, Francois Rameau, Seokju Lee, Junsik Kim, Philipp Benz, Dawit Mureja Argaw, Jean-Charles Bazin, In So Kweon, "Revisiting Residual Networks with Nonlinear Shortcuts", **BMVC 2019, spotlight (8.6%)**.

6. Philipp Benz[†], **Chaoning Zhang**[†], Adil Karjauv, In-So Kweon, "Revisiting Batch Normalization for Improving Corruption Robustness", **WACV 2021**.

7. Philipp Benz[†], **Chaoning Zhang**[†], Adil Karjauv, In-So Kweon, "Universal Adversarial Training with Class-Wise Perturbations", **ICME 2021**.

8. Philipp Benz[†], Soomin Ham[†], **Chaoning Zhang**[†], Adil Karjau, In So Kweon, "Adversarial robustness comparison of vision transformer and MLP-Mixer to CNNs", **BMVC 2021**.

9. Adil Karjauv, Sanzhar Bakhtiyarov, **Chaoning Zhang**, Jean-Charles Bazin, In-So Kweon, "MotionSnap: A Motion Sensor-Based Approach for Automatic Capture and Editing of Photos and Videos on Smartphones", **ICME 2021**.

10. Philipp Benz†, **Chaoning Zhang**†, Tooba Imtiaz, In-So Kweon, "Double Targeted Universal Adversarial Perturbations", **ACCV 2020**.

Recent workshop papers

1. **Chaoning Zhang**†, Philipp Benz†, Gyusang Cho†, Adil Karjauv, Soomin Ham, Chan-Hyun Youn, In So Kweon, "Backpropagating Smoothly Improves Transferability of Adversarial Examples" **CVPR2021 workshop**.

2. **Chaoning Zhang**†, Philipp Benz†, Soomin Ham†, Adil Karjauv, In So Kweon, "Is FGSM Optimal or Necessary for $L\infty$ Adversarial Attack?" **CVPR2021 workshop**,

3. **Chaoning Zhang**†, Philipp Benz†, Adil Karjauv, In So Kweon, "Stochastic Depth Boosts Transferability of Non-Targeted and Targeted Adversarial Attacks" **ICLR2021 workshop** on RobustML.

4. **Chaoning Zhang**†, Philipp Benz†, Adil Karjauv, In So Kweon, "On Strength and Transferability of Adversarial Examples: Stronger Attack Transfers Better" **ICLR2021 workshop** on RobustML.

5. **Chaoning Zhang**†, Philipp Benz†, Adil Karjauv†, In So Kweon, "Towards Data-free Universal Adversarial Perturbations with Artificial Jigsaw Images" **ICLR2021 workshop** on RobustML.

6. Philipp Benz†, **Chaoning Zhang**†, Soomin Ham†, Adil Karjauv, In So Kweon, "Robustness Comparison of Vision Transformer and MLP-Mixer to CNNs" **CVPR2021 workshop**. (**Outstanding paper award**).

7. Philipp Benz†, **Chaoning Zhang**†, Soomin Ham, Adil Karjauv, Gyusang Cho, In So Kweon, "The Triangular Trade-off Between Accuracy, Robustness, and Fairness" **CVPR2021 workshop**.

8. Philipp Benz†, **Chaoning Zhang**†, Adil Karjauv, In So Kweon, "Batch Normalization Increases Adversarial Vulnerability and Decreases Adversarial Transferability: A feature perspective" **ICLR2021 workshop** on RobustML.

9. Philipp Benz†, **Chaoning Zhang**†, Adil Karjauv, In So Kweon, "Towards Simple Yet Effective Transferable Targeted Adversarial Attacks" **ICLR2021 workshop** on RobustML.

10. Philipp Benz†, **Chaoning Zhang**†, Adil Karjauv, In So Kweon, "Robustness May Be at Odds with Fairness: An Empirical Study on Class-wise Accuracy" **NeurIPS2020 pre-registration workshop**.

11. Philipp Benz†, **Chaoning Zhang**†, Tooba Imtiaz, In So Kweon, "Data from Model", **CVPR 2020 workshop** on Adversarial Machine Learning in Computer Vision.

12. Philipp Benz†, **Chaoning Zhang**†, Tooba Imtiaz, In So Kweon, "Universal Adversarial Perturbations are Not Bugs, They are Features", **CVPR 2020 workshop** on Adversarial Machine Learning in Computer Vision.

13. Dawit Mureja Argaw, Junsik Kim, Francois Rameau, **Chaoning Zhang**, In So Kweon, "Restoration of Video Frames from a Single Blurred Image with Motion Understanding", **CVPR workshop 2021**.

Recent Journal papers

1. Axi Niu, Yu Zhu, Chaoning Zhang, Jinqiu Sun, Pei Wang, In So Kweon, Yanning Zhang, "MS2Net: Multi-Scale and Multi-Stage Feature Fusion for Blurred Image Super-Resolution", **IEEE Transactions on Circuits and Systems for Video Technology**

2. Jiawen Liao, Chun Qi, Jianzhong Cao, Xiaofang Wang, Long Ren, Chaoning Zhang, "Rotation-aware correlation filters for robust visual tracking", **Journal of Visual Communication and Image Representation**

Publication in the old days (before PhD study)

Conference papers

1. **Chaoning Zhang**, He Zhang, Baoquan Kou, "The Comparison Study of two Servo Dynamic Stiffness Definitions for Linear Motor Servo Systems", 18th International Conference on Electrical Machines and Systems (ICEMS), 2015.

2. **Chaoning Zhang**, Caiyan Qin, "Exploration of the Growing Trend of Electric Vehicles in Beijing with System Dynamics method and Vensim model", Proceedings of the 32nd International of the System Dynamics Society, 2014.

3. He Zhang, Baoquan Kou, **Chaoning Zhang**, "A New Position Loop Servo Stiffness Testing Method for Linear Motor Servo System", 18th International Conference on Electrical Machines and Systems (ICEMS), 2015.

4. Baoquan Kou, Feng Xing, **Chaoning Zhang**, "Synchronous control of dual linear motors based on advanced space voltage vector switch table", The 17th International Symposium on Electromagnetic Launch Technology, 2014.

5. Baoquan Kou, Feng Xing, **Chaoning Zhang** et al., "Control strategy for nine phase maglev permanent magnet synchronous planar motors driven by composite current", 17th International Conference on Electrical Machines and Systems (ICEMS), 2014.

6. Feng Xing, Baoquan Kou, **Chaoning Zhang** et al., "Levitation force control of maglev permanent synchronous planar motor based on multivariable feedback linearization method", 17th International Conference on Electrical Machines and Systems (ICEMS), 2014.

7. Haitao Zheng, Caiyan Qin, **Chaoning Zhang**, Qihui Yang, "Applying policy network theory to the decision making process of the Three Gorges Dam project", International Conference on Construction and Real Estate Management, 2015.

Journal papers

1. Caiyan Qin, **Chaoning Zhang***, Haiyan Lu, "H-Shaped multiple linear motor drive platform control system design based on an inverse system method", Energies 10(12), 199001-17, 2017. (*Corresponding author)

2. Martin De Jong, Yawei Chen, Simon Joss, Haiyan Lu, Miaoxi Zhao, Qihui Yang, **Chaoning Zhang**, "Explaining city branding practices in China's three mega-city regions: The role of ecological modernization", Journal of Cleaner Production 179, 527-543, 2018.

3. Feng Xing, Baoquan Kou, Lu Zhang, Tiecheng Wang, **Chaoning Zhang**, "Analysis and Design of a Maglev Permanent Magnet Synchronous Linear Motor to Reduce Additional Torque in dq Current Control", Energies 11(3), 556, 2018.

4. Baoquan Kou, Feng Xing, Lu Zhang, **Chaoning Zhang**, "A Real-Time Computation Model of the Electromagnetic Force and Torque for a Maglev Planar Motor with the Concentric Winding", Applied Science 7(1), 98, 2017.

5. Baoquan Kou, Feng Xing, **Chaoning Zhang**, "Improved ADRC for a Maglev Planar Motor with a Concentric Winding Structure", Applied Science 6(12), 419, 2016.

6. Baoquan Kou, Feng Xing, **Chaoning Zhang**, "Optimal Time Control for a Magnetic Levitation Linear Servo System", Applied Mechanics and Materials, 416, 670-675, 2013.

7. Baoquan Kou, Lu Zhang, Binchao Zhang, **Chaoning Zhang**, "Analysis and Optimization of a Linear Synchronous Motor with Novel Halbach Magnet Array", Applied Mechanics and Materials 416, 104-108, 2013.

8. Hailin Zhang, Baoquan Kou, Shouming Zhou, Lily Li, **Chaoning Zhang**, "The Highest Efficiency Control of the Stirling Linear Generator", Applied Mechanics and Materials 416, 503-508, 2013.

9. He Zhang, Baoquan Kou, Hailin Zhang, Yinxi Jin, **Chaoning Zhang**, "Structural Optimization of an Integrated Winding Structure Short-stroke Planar Motor Driven by Square DC Coils and Permanent Magnets", Applied Mechanics and Materials 416, 221-226, 2013.

10. He Zhang, Bao Quan Kou, Shou Lun Guo, Hai Lin Zhang, Yin Xi Jin, **Chaoning Zhang**, Li Yi Li, "Research on the End Effect Detent Force Reduction of Permanent Magnet Linear Synchronous Motor with Auxiliary Poles One-piece Structure", Applied Mechanics and Materials 416, 27-32, 2013.