

Yingyi Chen

KU Leuven
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Education

- 2019–2024 **Ph.D. in Engineering Science**, KU Leuven, Leuven, Belgium.
Supervisor: *Prof. dr. ir. Johan A.K. Suykens*
Jury: *Toon van Waterschoot, Jos De Brabanter, Patrick Wollants, Lynn Houthuys, and Julien Mairal.*
Thesis: Deep Learning Models: Duality, Robustness and Generalization Properties
2016–2019 **Ph.D. candidate in Statistics**, Renmin University of China, Beijing, China.
Supervisor: *Prof. dr. Chunrong Ai*
Research: Statistics, Statistical learning theory
2012–2016 **B.S. in Statistics**, Huazhong University of Science and Technology, Wuhan, China.

Awards and Honors

- 2023 Recipient of **Research Travel Grant** from KU Leuven.
2016-2018 Recipient of **Academic Scholarship** from Renmin University of China.
2013-2015 Recipient of **Premium Student of Qiming College** (top 1%) of Huazhong University of Science and Technology.
2013-2015 Recipient of **First-Class Scholarship** (top 5%) from Huazhong University of Science and Technology.
2014 Recipient of **National Scholarship** (top 0.2%, highest honor) from Ministry of Education of P.R. China.

Teaching Activities

Teaching Assistant of Graduate Courses

- 2020–present **Teaching Assistant**, *Support Vector Machines: Methods and Applications [H00H3a]*.
Weekly computer lab exercises, assign and mark homework.
2019–present **Teaching Assistant**, *Data Mining and Neural Networks [H05R4a]*.
Weekly computer lab exercises, assign and mark homework.

Daily Supervisor of Master Theses in Mathematical Engineering

- 2023-2024 Object Detection through Multi-view Kernel Spectral Clustering Analysis, by Arno Waes, *ongoing*, KU Leuven.
2022-2023 Combating Label Noise with Learnable Principal Component Analysis, by Alessia Denti, *Erasmus+ EU programme for education, training, youth and sport*, European Commission.
2020-2021 Bernoulli Random Density Forest, by Iker Camara Bengoechea, *Cum Laude Graduation Award*, KU Leuven.
2019-2020 Random Support Vector Trees: Towards Reconciling Random Forests in Theory and Practice, by Vincent Buekers, *Cum Laude Graduation Award*, KU Leuven.

Academic Services

Journal Reviewer

- 2020–present IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), IEEE Transactions on Neural Networks and Learning Systems (TNNLS), Neural Networks, Machine Learning, Pattern Recognition Letters (PRL), Multimedia Systems

Organization of Scientific Events

- 2023 Co-organizer of Rethinking Transformers through Duality and New Directions Workshop, Leuven.AI junior researchers day.

Open-Source Software

- Primal-Attention I'm the main author of the open-source Primal-Attention package, where we provide a new perspective to represent and optimize self-attention through asymmetric Kernel Singular Value Decomposition (KSVD), which is also motivated by the low-rank property of self-attention normally observed in deep layers.

- Jigsaw-ViT I'm the main author of the open-source Jigsaw-ViT package, where we explore solving jigsaw puzzle as a self-supervised auxiliary loss in vision transformers (ViTs), obtaining better generalization properties and robustness for image classification.
- NCT I'm the main author of the open-source Nested Co-teaching (NCT) package, a new method that provides state-of-the-art performances for convolutional neural networks to conduct robust learning against label noise for image classification.

Computer Skills

Programming Python (PyTorch), MATLAB, R, HTML, LaTeX, MS Office. See my released codes on GitHub.

List of Publications

Journal Articles

- 2023 **Yingyi Chen**, Xi Shen, Yahui Liu, Qinghua Tao, and Johan A.K. Suykens. Jigsaw-vit: Learning jigsaw puzzles in vision transformer. *Pattern Recognition Letters (PRL)*, volume 166, pages 53–60. Elsevier, 2023.
- 2022 **Yingyi Chen**, Shell Xu Hu, Xi Shen, Chunrong Ai, and Johan A.K. Suykens. Compressing features for learning with noisy labels. *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*. IEEE, 2022.

Conference Proceedings

- 2024 **Yingyi Chen***, Qinghua Tao*, Francesco Tonin, and Johan A.K. Suykens. Self-attention through kernel-eigen pair sparse variational gaussian processes. *International Conference on Machine Learning (ICML)*, 2024.
- 2024 Qinghua Tao, Francesco Tonin, Alex Lambert, **Yingyi Chen**, and Johan A.K. Suykens. Learning in feature spaces via coupled covariances: Asymmetric kernel svd and nystrom method. *International Conference on Machine Learning (ICML)*, 2024.
- 2024 Yuting Li, **Yingyi Chen**, Xuanlong Yu, Dexiong Chen, and Xi Shen. SURE: SURvey REcipes for building reliable and robust deep networks. *International Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.
- 2023 **Yingyi Chen***, Qinghua Tao*, Francesco Tonin, and Johan A.K. Suykens. Primal-attention: Self-attention through asymmetric kernel SVD in primal representation. *Advances in Neural Information Processing Systems (NeurIPS)*, 2023.
- 2021 **Yingyi Chen**, Xi Shen, Shell Xu Hu, and Johan A.K. Suykens. Boosting co-teaching with compression regularization for label noise. *International Conference on Computer Vision and Pattern Recognition Workshop (CVPR Workshop)*, pages 2688–2692, 2021.
- 2021 Fanghui Liu, Xiaolin Huang, **Yingyi Chen**, and Johan A.K. Suykens. Fast learning in reproducing kernel krein spaces via signed measures. *International Conference on Artificial Intelligence and Statistics (AISTATS)*, pages 388–396, 2021.