

# Oğuz Kaan YÜKSEL

## PERSONAL DATA

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CITIZENSHIP: Turkey  
RESIDENCE: Switzerland  
EMAIL: [oguz.yuksel@epfl.ch](mailto:oguz.yuksel@epfl.ch)  
GITHUB: <https://github.com/okyksl>  
WEBSITE: <https://okyksl.gitlab.io>

## EDUCATION

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2020 - M.Sc. in DATA SCIENCE and MATHEMATICS (Minor)  
PRESENT **École Polytechnique Fédérale de Lausanne**  
GPA: 5.85 / 6

2019 - 2020 Exchange Semester in MATHEMATICS  
**Amsterdam University College, University of Amsterdam**

2015 - 2020 B.Sc. in COMPUTER ENGINEERING & MATHEMATICS (Double Major)  
**Boğaziçi University, Istanbul**  
GPA: 3.85 / 4 (1st ranked in class)

## RESEARCH EXPERIENCE

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SEP 2020 - **Semantic Perturbations for Improved Generalization and Robustness** [1, 2]

MAR 2021 **Advisors:** [Sebastian U. Stich](#) and [Tatjana Chavdarova](#), EPFL  
Exploiting the exactly reversible encoder-decoder structure of normalizing flows, we perform on-manifold perturbations in the latent space to define fully unsupervised data augmentations. We demonstrate that such perturbations match the performance of advanced data augmentation techniques and outperform existing methods, particularly in low data regimes. We find that our latent adversarial perturbations adaptive to the classifier throughout its training are most effective, yielding the first test accuracy improvement results on real-world datasets. We discuss implications of our findings on robustness and generalization.

DEC 2020 - **LatentCLR: A Contrastive Learning Approach for Unsupervised Discovery of Interpretable Directions** [3]

MAR 2021 **Advisor:** [Dr. Pınar Yanardağ](#)  
In this work, we propose a contrastive-learning-based approach for discovering semantic directions in the latent space of pretrained GANs in a self-supervised manner. These directions provide controllable generation and support a wide range of semantic editing operations such as zoom or rotation.

FEB 2020 - **Increasing Adversarial Variability with Randomized Gradients**

JUN 2020 **Advisor:** [Assist. Prof. İnci Meliha Baytaş](#), Boğaziçi University  
We observe various clustering behaviors when using fixed step sizes in PGD. We try to mitigate these issues with RGS, a randomized variant of PGD, which generates a more diverse set of adversarial samples. We show that RGS slightly improves over PGD and avoids "catastrophic overfitting" observed when using a small number of steps.

SEP 2019 - **Orthogonality Regularization for Adversarial Robustness** [4]

JAN 2020 **Advisor:** [Assist. Prof. İnci Meliha Baytaş](#), Boğaziçi University  
We demonstrate non-trivial robustness with a simple orthogonality-based regularization in deep neural networks. We explain why enforcing orthogonality in linear layers might be able to provide robustness. Lastly, we show that orthogonality regularization can be used with standard adversarial training to boost model robustness.

## WORK EXPERIENCE

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- JUL 2021 - SEP 2021 | NLP Engineer Intern at [DATA FRIENDLY SPACE](#)  
Developed transformers-based text classification solutions for heterogeneous multi-label classifications problem. Used MLFlow to track experiments and deploy models. Implemented online testing environment and conducted user experiments. Designed after-deployment workflows including continuous monitoring and learning.
- JAN 2019 - JAN 2021 | ML Engineer at [RATEME](#) (Part-time)  
Developed human detection, cloth segmentation and cloth parsing solutions using off-the-shelf deep networks. Implemented data pipelines for data standardization and filtering. Implemented demo apps visualizing the outputs of computer vision models (frontend & backend). Managed in-house GPU and web server. Supervised technical aspects of other works such as visual search and visual recommendation.
- JUN 2019 - JUL 2019 | Research Internship, [Centrum Wiskunde & Informatica](#) (Voluntary)  
**Advisors:** [Bojian Yin](#) and [Prof.dr. Sander M. Bohté](#)  
Investigated generalization and adversarial robustness of LocalNorm, a variant of BatchNorm, in supervised classification tasks by designing and implementing a testing framework with Tensorflow, Keras, NumPy and Cleverhans.
- JUN 2018 - DEC 2018 | R&D Intern at [VISPERA](#)  
**Advisor:** [Dr. Erdem Yörük](#)  
Implemented a mobile augmented reality application that provides real-time object recognition with automatic image capturing, on-device pre-processing (rectification and stitching) and a TensorRT backend which runs computer vision models for object recognition on retail surfaces.

## PUBLICATIONS

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- [1] **O. K. Yüksel**, S. U. Stich, M. Jaggi, and T. Chavdarova. “Semantic Perturbations With Normalizing Flows for Improved Generalization”. In: *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*. Oct. 2021, pp. 6619–6629.
- [2] **O. K. Yüksel**, S. U. Stich, M. Jaggi, and T. Chavdarova. “Semantic Perturbations with Normalizing Flows for Improved Generalization”. In: *ICML Workshop on Invertible Neural Networks, Normalizing Flows, and Explicit Likelihood Models*. 2021.
- [3] **O. K. Yüksel**<sup>\*</sup>, E. Simsar<sup>\*</sup>, E. G. Er, and P. Yanardag. “LatentCLR: A Contrastive Learning Approach for Unsupervised Discovery of Interpretable Directions”. In: *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*. Oct. 2021, pp. 14263–14272.
- [4] **O. K. Yüksel** and İ. M. Baytaş. “Adversarial Training with Orthogonal Regularization”. In: *2020 28th Signal Processing and Communications Applications Conference (SIU)*. IEEE. 2020, pp. 1–4.
- [5] D. Mizrahi, **O. K. Yüksel**, and A. M. Kyzy. “[Re] Can gradient clipping mitigate label noise?” In: *ML Reproducibility Challenge 2020*. 2021.

## SCHOLARSHIPS, PRIZES AND HONORS

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- 2020-21 Excellence Fellowship, **EPFL** (Fr. 36,000, about %3 of MS students receive)
- 2020 **1st** ranked student, department of Computer Engineering, **Boğaziçi University**
- 2020 **2nd** best senior project, department of Computer Engineering, **Boğaziçi University**
- 2019-20 Erasmus exchange grant, **Amsterdam University College**
- 2015-20 Boğaziçi Success Scholarship, **Boğaziçi University** (monetary, dormitory and food)
- 2015-20 National Success Scholarship, **Boğaziçi University** (monetary)
- 2015 **3rd** ranked out of 1,987,488 students, **ÖSYS** (Turkish equivalent of SAT)
- 2015 Silver medal, **Turkey National Informatics Olympiad**
- 2012 Silver medal, **Turkey National Elementary Mathematics Olympiad**

## EXTRACURRICULAR ACTIVITIES

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- 2021 Student assistant for Machine Learning (CS-433), EPFL  
2020 Organized [Winter School](#) on Synchronization with [Suzan Üsküdarlı](#) & [NODDS Lab](#)  
2015-17 Voluntarily tutored programming (10+ games supervised) and math for primary and high school students.

## LANGUAGES

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TURKISH: Native  
ENGLISH: C1, TOEFL iBT: 111 / 120  
FRENCH: Beginner

## TECHNICAL SKILLS

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**Programming languages:** Python, C/C++, Javascript, Java, Swift, Objective-C, MATLAB  
**Frameworks:** Keras, Tensorflow, PyTorch, Pandas, Scikit-learn, NumPy, AngularJS, VueJS, NodeJS  
**Tools:** Git, Conda, Colab, Unix, npm, tmux