

Çağın Selim Çoban

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SUMMARY

I am a dedicated video coding researcher at Qualcomm Inc. with a strong mathematical background and exceptional research skills. Also, I have a keen focus on computer vision, specializing in the domains of video instance segmentation and tracking. Additionally, I am proficient in coding in C++ and efficiency practices, including migrating source code from Python for release integration. My enthusiasm for solving complex challenges and driving innovation in video technology fuels my commitment to delivering exceptional results.

PROFESSIONAL AND PROGRAMMING SKILLS

C/C++ (Video Coding, Embedded, Image Processing, and CUDA), **Python** (PyTorch, TensorFlow, OpenCV, Scipy and Matplotlib), **MATLAB**, **Linux/Bash Scripting**, **Git/VCS**, **Docker**, **Full Stack Web**.

WORK EXPERIENCE

- **Qualcomm CDMA Technologies GmbH** Munich, Germany
Video Research Engineer *June 2022 - present*
 - Involved in designing and implementing efficiency-critical video coding algorithms in C/C++ for standardization. Achieved optimization through multi-threading and SIMD instruction utilization. Designed and implemented internal tools utilizing Python and Bash scripting to perform post-processing tasks on simulation data.
 - Filed IDFs (invention disclosure forms) and acted as a representative for Qualcomm at standardization conferences: JVET and MPEG.
- **Koc-Isbank (KUIS) AI Lab - Autonomous Vision Group** Istanbul, Turkey
Research Assistant and Lab Fellow *Jan. 2020 - Sep. 2022*
 - **(Thesis Project) TLTM: Two-Level Temporal Model For Video Instance Segmentation** *Video Object/Instance Segmentation with Object-Centric Graph Neural Networks*. **Supervisors:** Fatma Güney (Koc University), Jordi Pont-Tuset (Google Zurich). **Summary:** An online method that matches offline performance; powered by a message-passing graph neural network to track objects over time, along with a novel feature fusion module. This method was state-of-the-art in YouTube-VIS dataset in online methods while delivering competitive performance in DAVIS dataset.
- **Omnisight AI - (NVIDIA Inception Program Startup)** Istanbul, Turkey
Embedded Vision Systems Software Engineer *Oct. 2019 - Mar. 2020*
 - SW/HW R&D for edge-optimized video analytics deep learning models (crowd counting, pedestrian tracking and human pose estimation) for digital advertising panels on NVIDIA Jetson embedded board with TensorRT.
- **ParanaVision** Ankara, Turkey
Computer Vision Software Engineer - Intern *Aug. 2018 - Sep. 2018*
 - **Project:** Banknote Visual Control System for Central Bank of the Republic of Turkey (TCMB) in CUDA C/C++
- **Meteksan Defence A.S.** Ankara, Turkey
Embedded Software Engineer - Intern *July. 2017 - Sep. 2017*
 - **Project:** Tactical Baseband (NATO III+/IV) IP Radio, integrated code in C/C++ for RTOS.

EDUCATION

- **Koç University** Istanbul, Turkey
Master of Science in Computer Science and Engineering *Jan. 2020 - Sep. 2022*
- **Bilkent University** Ankara, Turkey
Bachelor of Science in Electrical and Electronics Engineering *Aug. 2015 - Jun. 2019*

PUBLICATIONS

- C. S. Coban, O. Keskin, J. Pont-Tuset, F. Guzey. Two-Level Temporal Relation Model for Online Video Instance Segmentation, arXiv Paper, 2022.
- M. E. Akbiyik, C. S. Coban, E. Aygun, H. Z. Imamoglu, D. Gurgunoglu and D. Ider, "ThermoCam: Smart Baby Monitoring Assistant," 2020 IEEE 44th Annual Computers, Software, and Applications Conference (COMPSAC), Madrid, Spain, 2020, pp. 636-643, doi: 10.1109/COMPSAC48688.2020.0-185.

AWARDS

- **AI Lab Fellowship - KUIS AI Lab** Granted AI Lab Fellowship of Koc-Isbank AI Lab.
- **Research Excellence Award - Bilkent University Department of Electrical and Electronics Engineering** Won the award in 2015 cohort with the 3D computer vision research project: Aerial Site Intelligence System.

THESIS PROJECTS

- **Thermal Camera Assisted Baby Monitor:** A computer vision powered baby monitor system is developed with six senior students under the supervision of the company VESTEL. The aim is to continuously track the body temperature of a baby and notify the parents or caretakers via a cloud system if temperature is outside of the healthy range. This project is received a grant by TÜBİTAK (The Scientific and Technological Research Council of Turkey).
- **Aerial Site Intelligence System by UAV Imagery:** An aerial site intelligence system is developed to perform 3D reconstruction (by stereoscopic vision and Structure from Motion) and object detection with localization (by Faster R-CNN) under the supervision Prof. Dr. Levent Onural (IEEE Fellow and Secretary of IEEE).

SELECTED PROJECTS

- **Flying MNIST:** Created a dataset with moving MNIST digit sequences for video instance segmentation with optical flow data.
- **C-SWM:** Coded and replicated Thomas Kipf's ICLR 2020 paper, C-SWM in Julia and implemented improvements with continuous action.
- **Deep Shading:** Implemented a deep learning-based deferred shader for rendering screen space effects in PyTorch.
- **Bag of Visual Words (BoVW):** Image classifiers that utilize the Bag of Visual Words (BoVW) approach with three different classification algorithms implemented from scratch: naive bayes, logistic regression, and a neural network.
- **Natural Language Processing (NLP):** Completed 4 mini projects: Sentiment Analysis, Language Models, Neural Machine Translation and Attention.

TEACHING EXPERIENCE

- **COMP 100 - Introduction to Computer Science and Programming** Koç University
Teaching Assistant *Fall '20 - Spring '22*
 - I completed four semesters of teaching assistantship, during which I taught Python and Bash scripting, and also prepared exams and assignments for computer science freshmen.

LANGUAGE SKILLS

- **English - C1** Professional working proficiency. TOEFL iBT: 99
- **Turkish** Mother tongue **German:** Elementary proficiency

MISC

- **Member of IEEE - Region 8 (for 5 years) and IEEE CS Society**