Cafer Avci

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Skills

Programming: Python, C++, C, SQL, HTML, CSS, React
Simulation & Modeling: SUMO, Aimsun, Agent-based Simulation, Traffic Modeling & Simulation, Vehicle Control
Cloud & DevOps: AWS (EC2, RDS, S3), Docker, FastAPI
Project Management: Agile, Road mapping, Team Leadership, Cross-functional Coordination
AI & Data: Generative AI, LLMs, Data Analytics, Gurobi, MATLAB, GIS

Professional Experience

Postdoctoral Research Associate of Systems Engineering, Cornell University   April 2023 – Present
- Lecturer of Digital Systems Modeling with Generative AI in Systems Engineering
- Lead in Urban Technology, Environmental & Health Hub Development
- Productization, Dev-Ops, building cloud-based infrastructure for digital twins and urban mobility analysis frameworks

SW/Control System Simulation Engineer, National Electric Vehicle Sweden, Sweden   June 2022 – April 2023
- Performing integrated traffic and vehicle simulations of autonomous shuttle
- Theoretical open-source developments for traffic simulation environment and its optimization
- Designing and developing interfaces for integrated user services and simulation environments

Postdoctoral Researcher of Transportation Engineering, Aalto University, Finland   June 2019 – June 2022
- Collaborative research in behavior modeling of multiple autonomous vehicles in mixed traffic condition
- Macroscopic and microscopic traffic simulation in Aimsun
- Participating in various multi-national grant proposals

Research Assistant of Computer Engineering, Yalova University, Turkey   March 2011 – June 2019
- Conducting research related with MSc and PhD studies
- Teaching programming languages including C, Mikro-C, C++, C#
- Supervising students, managing projects, servicing department works

Founder, Mihman Technology, Bursa, Turkey   March 2013 – June 2015
- Designing and developing portable traffic data logger and analyzer
- Designing and planning the architecture of national intelligent transportation system for Turkey
- Consulting, development and testing of software and hardware for ITS

Enterprise Software Development

- Lumeo: Navigation App, VRP, iOS, Firebase, Figma, Air Quality-based multi-modal navigation.
- Mobility Analyzer: Instantaneous urban mobility analysis framework, React, GenAI, SUMO, AWS RDS, S3, EC2, etc.
- uTECH DataHub, Mobility, Environmental Data Analysis Portal, Apache Superset, AWS RDS, EC2, Fast API.
- Emission Analyzer: Integrated upscaled EPA MOVES, React, MariaDB, Fast Api, Figma, etc.
- uTECH-Cities: Digital Twin, Vertical integration of AI, SUMO, EPA MOVES, Aermod, BenMap, and internal apps, service deployment, orchestration, AWS, EC2, RDS, S3, APIs, etc.

Open-Source Software Development

- DLSim-MRM, Open-Source Dynamic Traffic Simulation Package with Multi-Resolution Models.
- NeXTA4GMNS, Network explorer for Traffic Analysis for General Modeling Network Specification (GMNS).
- GTFS2GMNS, General Transit Feed Specification (GTFS) to General Modeling Network Specification (GMNS).
- MRMNetworkMerger, Open-Source Network Merger of Macroscopic and Microscopic Layers.

Education

PhD of Computer Engineering, Yildiz Technical University, Istanbul Turkey	July 2018
Visiting PhD Scholar of Transportation Engineering (1 year), Arizona State University, Tempe, AZ	Feb 2017
MSc of Computer Engineering, Yalova University, Yalova, Turkey	July 2012
BSc of Computer and Control Technology (English), Marmara University, Istanbul, Turkey	July 2009

Professional & Academic Works

Guest Editor: Special Issue on Big Data in Transportation, Expert Systems, Wiley.
Chair, Co-Chair for Conferences: Competition of Transportation Equity with TRB, June 2023, Indianapolis, IN
Reviewer for International Journals: IEEE ITS, TRE, TRR, Transport. B, COR, ANOR, IET Intelligent Transport Systems, etc.
Published journal papers, peer-reviewed proceedings, presentations, and ongoing works in expertise areas
Participated, managed, and offered many various national, international projects