

# Hamid Aghel

📍 Home: Rome (Italy)

## ABOUT ME

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My name is **Hamid Aghel**. I hold a **Bachelor's degree in Civil Engineering** from the Islamic Azad University of Mashhad and a **Master's degree in Transport Systems Engineering** from Sapienza University of Rome, where I achieved a **GPA of 28.81/30** and graduated with a **final grade of 110/110 with honors (cum laude)**. Following my graduation, I worked for over one year in the Transport Department as a **post-master's researcher and teaching assistant** in various courses. In addition, I independently taught a **Machine Learning course** at **Green Industrial Engineering for the Sustainable Development Department** of Sapienza University of Rome.

My master's thesis, conducted under the supervision of **Prof. Gaetano Fusco**, focused on the *"Investigation of an Explicit Formulation of the Optimal Cycle Length at Isolated Signalized Junctions Based on the Highway Capacity Manual (HCM) Delay Model."* During this research, I employed regression analysis, machine learning, deep learning techniques, and optimization algorithms to derive an optimal cycle length formulation for signalized junctions. I proposed a new, more comprehensive and accurate formulation compared to Webster's optimal cycle length and developed three predictive models—neural networks, polynomial regression, and support vector machines (SVM)—achieving an error rate of less than 2%.

During my post-master's research fellowship, I contributed to five research projects under the umbrella titled *"Infrastructure and Transport Systems Estimation and Evaluation: Exploring Artificial Intelligence Techniques in Combination with Big Data for Predicting Road Safety"* at the **Department of Civil, Building, and Environmental Engineering**, Sapienza University of Rome. These projects included:

- Road Safety Analysis in Africa:** Analysis of road safety pillars (management, infrastructure, users, speed, and post-crash response) and traffic incidents across African countries, based on more than 1,500 scientific publications with at least one African affiliation published between 2000 and 2024.
- Text Analysis in Road Safety:** Application of machine learning models to categorize textual data in the road safety domain. In this research, **BERT (Bidirectional Encoder Representations from Transformers)**, a state-of-the-art natural language processing (NLP) model, was employed for text classification.
- Satellite Image Analysis:** Analysis of road surface conditions across large regions of Africa using deep learning models applied to satellite imagery.
- Digitalizing Freight Transport:** Development of physical and digital solutions through the integration of infrastructure and logistics vehicles in urban logistics networks using connectivity and sensor deployment to improve system efficiency. This research has been submitted to the **TRA Budapest 2026 Conference**.
- Real-Time Crash Risk Assessment Tools:** Development of machine learning and deep learning models to predict the probability of traffic incidents on selected motorways in the Lazio region, based on speed-related indicators derived from real-time, coordinate-based traffic data.

Beyond traffic engineering, my research interests include **data processing, analysis, and optimization in Intelligent Transportation Systems (ITS)**, traffic safety, freight transport and logistics, railway systems, and urban transportation, with a strong emphasis on **sustainable mobility and environmental considerations**. Additionally, I possess advanced computer skills in **network management, hardware technical support, and IT operations**. Motivated by a strong interest in intelligent transportation systems, I aim to leverage **IT and AI technologies** to optimize traffic flow, enhance road safety, and promote sustainable mobility.

## WORK EXPERIENCE

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 **Sapienza University of Rome - Professor Luca Persia – Roma, Italy**

### Post-Master's Research Project at Sapienza University - Full-time

[ 01/10/2024 – 30/09/2025 ]

A research contract titled “**Infrastructure and Transport Systems Estimation and Evaluation: Exploring Artificial Intelligence Techniques in Combination with Big Data for Predicting Road Accidents**”, under the supervision of **Prof. Luca Persia**. I was involved as a researcher in **five different projects**:

1. **Road Safety in Africa**: I reviewed and analyzed journal papers published between 2000 and 2024 to study road accidents in African countries based on the road safety pillars. I conducted this project independently as a standalone researcher.
2. **Text Analysis in Road Safety**: I implemented machine learning, deep learning, and AI techniques to analyze textual data from a large road safety and transportation systems dataset. In this team-based project, I configured BERT, logistic regression, and AI agent models for data analysis.
3. **Satellite Image Analysis**: I analyzed satellite imagery using deep learning models to detect road quality, including road surface type (e.g., asphalt, sand) and the number of lanes. I labeled the images and evaluated different deep learning models.
4. **Digitalizing Freight Transport**: This project aimed to provide physical and digital solutions through the integration of infrastructure and logistics vehicles in urban logistics networks and operations, using connectivity and sensor deployment to improve system efficiency via AnyLogic software. The results demonstrate how automated vehicles and digital communications improve freight transport efficiency by reducing travel time, delays, and travel distance. This research has been submitted to the **TRA Budapest 2026 Conference**. I built and configured the entire model and scenarios in AnyLogic and authored the methodology, analysis, and results sections of the paper.
5. **Regional Observatory on Mobility and Road Safety**: This project aims to develop machine learning and deep learning models to predict the probability of road crash incidents on Lazio’s motorways based on speed indicators derived from real-time, coordinate-based traffic data analysis. I used QGIS to manage spatial data, select and extract accident and non-accident events, compute speed indicators across selected time frames and locations, and ultimately developed classification models to predict accidents.

The coordinator of these projects is **Dr. Davide Shingo Usami**.

 **Sapienza University of Rome – Roma, Italy**

### Teaching Assignment

[ 01/10/2025 – 26/01/2026 ]

In the first semester of the 2025–2026 academic year, I taught a **Machine Learning course** (9 ECTS, 90 hours) as a **standalone instructor** at the **Department of Green Industrial Engineering for Sustainable Development**. I was solely responsible for course design, preparation of teaching materials, lecturing, and the evaluation of students’ examinations.

 **Sapienza University of Rome – Roma, Italy**

### Collaboration on the Railway Engineering Course – Part-Time

[ 24/09/2025 – 31/12/2025 ]

I prepared course materials and conducted research on topics related to the application of machine learning in maintenance and the prediction of rail track displacement within the Railway Engineering course, under the supervision of **Prof. Riccardo Licciardello**.

 **Sapienza University of Rome – Rome, Italy**

### **Supporting Master's Student in the Transportation Systems Department as a Teaching Assistant**

[ 23/09/2024 – 31/12/2024 ]

**Tasks carried out during the first semester of the 2024–2025 academic year:**

- Preparation of teaching materials for the courses **Freight Transport and Logistics**, under the supervision of **Prof. Chiara Colombaroni**, and **Sustainable Transport Planning**, under the supervision of **Prof. Luca Persia**.
- Summarizing and translating academic books and course materials.
- Addressing and resolving students' academic and technical issues.

 **Hochschule Karlsruhe of applied sciences in Germany (Prof. Jan Riel) – Karlsruhe, Germany**

### **Internship**

[ 29/07/2022 – 09/2022 ]

I developed expertise in **MATSim** and **Java programming** for **agent-based modeling in urban environments**, under the supervision of **Prof. Jan Riel**.

 **Sapienza University of Rome – Roma, Italy**

### **Student Tutoring**

[ 16/01/2023 – 16/03/2023 ]

Tutoring students at the information desk office at the civil engineering department.

 **Self-employment – Rome, Italy**

### **Consulting International Students**


[ 01/01/2020 – 31/12/2022 ]

- Consulting students applying for Italy
- Applying to universities
- Applying for scholarships
- Applying for the Erasmus program
- Applying for all kinds of office work in Italy

 **Civil engineering faculty of Azad University of Mashhad – Mashhad, Iran**

### **Assistant Teacher**

[ 20/09/2016 – 21/05/2017 ]

I have tutoring and teaching experience in civil engineering courses, including Road Design and Construction, Reinforced **Concrete Structures**, and **Fluid Mechanics**.  **Education Organization of Iran – Sarakhs, Iran**

### **Secondary School Teacher**

[ 20/06/2018 – 21/06/2020 ]

I taught **Mathematics, Physics, and English** for two years in high schools operated by the **Sarakhs Education Organization**, as an alternative to military service based on my academic qualifications.

 **Sivan Shargh – Mashhad, Iran**

## Internship

[ 21/06/2016 – 21/09/2016 ]

During my internship, I gained hands-on experience in all procedures and processes involved in building and construction development, including obtaining official permits, creating and modifying architectural and structural plans, conducting quantity surveying and cost estimation, and applying empirical methods acquired during my civil engineering studies.

 **Transportation Systems Engineering Department of Sapienza University – Rome, Italy**

## Student Representative

[ 12/05/2021 – 31/08/2024 ]

I was resolving students' issues in the meeting board of the department as a member of CAD.

 **Owner – Mashhad, Iran**

## Manager of Computer Services

[ 27/09/2014 – 27/09/2015 ]

I managed and developed the internet network services in my city while holding this office.

 **Maadiran Company – Mashhad, Iran**

## Technical Technician

[ 22/11/2017 – 20/07/2020 ]

I was a technical assistant to repair electronic devices and provide customer service for Maadiran digital products. (Full-time in 2017-2018 and part-time in 2018-2020)

## EDUCATION AND TRAINING

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### Diploma

**Imam Reza high school - Education organization of Iran** [ 23/09/2009 – 20/06/2013 ]

**Address:** Farhad No 24, Mashhad (Iran) | **Website:** <https://razavi.medu.ir/> | **Field(s) of study:** Mathematics and Physics | **Final grade:** 19.13/20

### B.Sc.

**Islamic Azad University Mashhad Branch** [ 23/09/2013 – 21/06/2017 ]

**Address:** Ostad Yusefi intersection, Mashhad (Iran) | **Website:** <https://mashhad.iau.ir/fa> | **Field(s) of study:** Civil Engineering | **Final grade:** 17.13/20

### Erasmus Study Program

**Hochschule Karlsruhe university of applied sciences** [ 28/09/2021 – 12/07/2022 ]

**City:** Karlsruhe | **Country:** Germany | **Website:** <https://www.h-ka.de/> | **Field(s) of study:** Transportation Systems Engineering | **Final grade:** 1.7/5

### M.Sc.

**Sapienza University of Rome** [ 22/09/2020 – 17/01/2024 ]

**Address:** Via Eudossiana, 18, 00184 Rome (Italy) | **Website:** <https://www.uniroma1.it/> | **Field(s) of study:** Transport Systems Engineering | **Final grade:** 28.81/30 - 110/110 with honors | **Thesis:** Investigation of an Explicit Formulation of the Optimal Cycle Length at Isolated Signalized Junctions Based on The Highway Capacity Manual (HCM) Delay Model

Supervisor: Prof. Gaetano Fusco

Methodologies: Optimization method (Golden Section Search) - Sensitivity Analysis - Regression Analysis - Deep Learning Models (Neural Network - Polynomial Regression - SVM)

## CONFERENCES AND SEMINARS

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[ 06/09/2016 ] Athens

### 4th International Conference on Research in Engineering, Science and Technology

I collaborated with my colleague, **Helma Ghasemzade**, on the research project titled “*Provide a Method for Planned Maintenance and to Achieve High Reliability Plane.*” My contribution involved developing a **MATLAB code** to detect the probability of failure in different components of the aircraft and predict the reliability of each system. This analysis is critical, as it can be used to estimate the reliability of the entire aircraft and inform maintenance planning. The project presented a method based on a **multi-class system**, which predicts the reliability of each subsystem and subsequently estimates the overall flight reliability based on subsystem parameters. While I was not involved in writing the paper, I independently built the **machine learning model** used for data analysis as a freelancer. This research was presented at an **international conference** held in **Athens, Greece, on 16 September 2016.**

Link: <https://www.sid.ir/paper/865718/fa>

[ 10/07/2016 ] Mashhad, Iran

### 4th International Conference on Science and Engineering

I collaborated with **Helma Ghasemzade** on the research project titled “*Investigating the Effect of the Neighborhood Parameter for Selecting the Cluster Head to Increase the Lifetime of Wireless Sensor Networks.*” My contribution was focused on the **machine learning component**, for which I developed a **MATLAB code** to classify and select the cluster head of the wireless sensor network.

Link: <https://civilica.com/doc/779056/>

[ 06/03/2024 ] Mashhad, Iran

### 15th International Traffic and Transportation Conference with Artificial Intelligence Approach in Civil Engineering

I presented **two papers** at an international conference on traffic engineering and Intelligent Transportation Systems (ITS), held at **Azad University of Mashhad, Iran**, my former bachelor’s institution. **Prof. Gaetano Fusco** (Chair of the Transportation Systems Department, Sapienza University of Rome) and **Dr. Natalia Isaenko** served as keynote speakers at the conference.

- 1. Influence of Human Factors in Bike-Sharing Systems: Hiring System, Safety, Phone Application, and Satisfaction (Author: Hamid Aghel):** This research compared two types of bike-sharing systems: **dock-based** (station-to-station) and **dockless** (free-floating). Station accessibility is a key factor influencing users’ choice of transportation mode. Using questionnaires and surveys, the study examined three major human factors affecting accessibility: the hiring system, safety concerns, and usability of the phone application. Data were collected in **Mashhad, Iran**, and compared with results from **Rome, Italy**, during May and June 2022.
- 2. Subjective Traffic Safety for Cyclists (Author: Hamid Aghel):** This study investigated **infrastructural and cultural impacts** on cyclists’ subjective traffic safety at signalized intersections. Cyclists are among the most vulnerable road users, frequently experiencing conflicts with cars and pedestrians, especially near junctions. The research analyzed human, vehicle, and environmental factors contributing to perceived risk and aimed to provide solutions for reducing car-pedestrian-cyclist collisions.

The study focused on how infrastructure and cultural elements influence cyclists' feelings of safety, referencing established regulations and codes, including the **German traffic code** and **NACTO guidelines**.

Link: <https://conference.nezammohandesi.ir/en/>

[ 18/05/2026 ] Budapest, Hungary

#### **Transport Research Arena (TRA) in Budapest 2026.**

Based on the **smart freight transport systems** I developed using **AnyLogic**, our research group authored the paper titled "*SMART URBAN FREIGHT TRANSPORT: ASSESSING THE OPPORTUNITY OFFERED BY AUTOMATED VEHICLES.*" My contributions included **building the simulation model in AnyLogic, generating results, and writing the methodology and results sections** of the paper. This paper was accepted for presentation in TRA conference.

**Authors:** Antonio Comi, Davide Shingo Usami, Sevket Oguz Kagan Capkin, Hamid Aghel, David Gruhonjić

Link: <https://traconference.eu/>

## **LANGUAGE SKILLS**

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**Mother tongue(s):** Persian

**Other language(s):**

### **English**

LISTENING C1 READING C1 WRITING C1

SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

### **German**

LISTENING A1 READING A1 WRITING A1

SPOKEN PRODUCTION A1 SPOKEN INTERACTION A1

*Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user*

### **Italian**

LISTENING A2 READING A2 WRITING A2

SPOKEN PRODUCTION A2 SPOKEN INTERACTION A2

## **SKILLS**

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### **Advanced computer skills**

ICDL Advanced / Excel (data analyzing) / A+ / Network+ / MCSE 2015

### **Programming languages**

Deep Learning / Machine Learning / MATLAB / Python / Java (basic) / Fortran / HTML 5: HTML/CSS/JQuery / Delphi / Android programming

### **Civil Engineering software**

AnyLogic Software / Civil 3D / QGIS: basic level / MATSim / AIMSUN( basic) / Autodesk AutoCAD / ETABS / SAFE