



## Dr. Gökhan Alcan

- April 12, 1990 (Age: 31)
- <https://www.gokhanalcan.com>
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### Research Interests

#### Modeling and Control

Control Theory and Applications

Model Predictive Control

System Identification

#### Robotics

Autonomous Driving

Ground and Aerial Vehicles

Manipulators

#### Machine Learning

Deep Learning

Reinforcement Learning

### Theses

Ph.D.

*Data Driven Nonlinear Dynamic Models for Predicting Heavy-Duty Diesel Engine Torque and Combustion Emissions*

M.Sc.

*Novel Vision Based Estimation Techniques for the Analysis of Cavitation Bubbles*

### Languages

- Turkish (native) ●●●●●
- English ●●●●●
- German ●●●●●

### Education

- 2015 – 2019 **Ph.D. in Mechatronics Engineering, Sabanci University** Istanbul, Turkey  
GPA: 3.67 / 4.00
- 2013 – 2015 **M.Sc. in Mechatronics Engineering, Sabanci University** Istanbul, Turkey  
GPA: 4.00 / 4.00
- 2008 – 2013 **B.Sc. in Mechatronics Engineering, Sabanci University** Istanbul, Turkey  
GPA: 3.45 / 4.00
- 2008 – 2013 **Math Minor Honor Program, Sabanci University** Istanbul, Turkey  
GPA: 3.67 / 4.00
- 2004 – 2008 **Çapa Anatolian Teacher's Training High School** Istanbul, Turkey  
Grade: 92.82/100

### Work Experience

- 2020 – ... Postdoctoral Researcher in Intelligent Robotics Research Group, Aalto University, Espoo, Finland.
- 2019 – 2020 Postdoctoral Researcher in Control, Vision and Robotics Research Group, Sabanci University, Istanbul, Turkey.
- 2015 – 2019 Research and Teaching Assistant in Mechatronics Engineering, Sabanci University, Istanbul, Turkey.
- 2013 – 2015 Research and Teaching Assistant in Mechatronics Engineering, Sabanci University, Istanbul, Turkey.

### Projects

- 2020 – ... **Bridging the Reality Gap in Autonomous Learning (B-REAL)**  
Academy of Finland  
Role: *Researcher* - Project No: 328399
- 2021 **State Estimation for Control in Autonomous Driving**  
Sensible 4, Finland  
Duration: *6 months* - Role: *Researcher*
- 2018 – 2019 **Machine Learning Techniques for Driver Evaluation in Heavy-Duty Vehicles**  
Ford Otosan, Turkey  
Duration: *1 year* - Role: *Researcher*
- 2016 – 2018 **System Identification Methods for Dynamic Calibration of Diesel Engines**  
Ford Otosan, Turkey  
Duration: *3 years* - Role: *Researcher*
- 2013 – 2016 **Design and Development of a National Endoscopic Device for Medical Applications Based on Hydrodynamic Cavitation**  
The Scientific and Technological Research Council of Turkey  
Duration: *3 years* - Role: *Researcher* - Project No: 113S092

### Publications

#### Preprints

- P1. 2021 **Differential Dynamic Programming with Nonlinear Safety Constraints Under System Uncertainties**  
G. Alcan, V. Kyrki,  
<https://arxiv.org/abs/2011.01051>

## Reviewer Invitation

### Journals

- Measurement, Journal of the Int. Measurement Conf.
- Turkish Journal of Electrical Eng. and Computer Sci.

### Conferences

- IEEE International Conference on Robotics and Automation
- IEEE International Conference on Intelligent Transportation Systems
- IEEE Intelligent Vehicles Symposium
- International Conference on Intelligent Computing
- International Conference on Unmanned Aircraft Systems
- IFAC International Symposium on Advances in Automotive Control
- IFAC Symposium on System Identification

## Teaching Experience

### Robotic Manipulation

2021 Fall Term

**Role:** Visiting Teaching Assistant  
**Instructor:** Prof. Dr. Ville Kyrki

### Reinforcement Learning

2020 Spring Term

**Role:** Visiting Lecturer  
**Instructor:** Prof. Dr. Ville Kyrki

### Autonomous Mobile Robotics

2013,2014,2015,2017,2018

**Role:** Teaching Assistant  
**Instructor:** Prof. Dr. Mustafa Unel

### Computer Vision

2016,2018 Fall Terms

**Role:** Teaching Assistant  
**Instructor:** Prof. Dr. Mustafa Unel

### Linear Algebra

2017 Fall Term

**Role:** Teaching Assistant  
**Instructor:** Dr. Canan Kasikci

### Systems Modeling and Control

2016 Spring Term

**Role:** Teaching Assistant  
**Instructor:** Prof. Dr. Mustafa Unel

### Control System Design

2014,2015 Fall Terms

**Role:** Teaching Assistant  
**Instructor:** Prof. Dr. Mustafa Unel

### Industrial Control

2012, 2013 Fall Terms

**Role:** Teaching Assistant  
**Instructor:** Assoc. Prof. Dr. Kemalettin Erbatur

### Introduction to Computing

2012 Spring Term

**Role:** Teaching Assistant  
**Instructor:** Dr. Gülşen Demiröz

## Journals

- J10. 2020 **Optimization-Oriented High Fidelity NFIR Models for Estimating Indicated Torque in Diesel Engines**  
**G. Alcan**, V. Aran, M. Unel, M. Yilmaz, C. Gurel, K. Koprubasi, *International Journal of Automotive Technology*, 21 (3), 729-737.
- J9. 2019 **Robust Trajectory Control of an Unmanned Aerial Vehicle Using Acceleration Feedback**  
H. Zaki, **G. Alcan**, M. Unel, *International Journal of Mechatronics and Manufacturing Systems*, 12 (3-4), 298-317.
- J8. 2019 **Estimating Soot Emission in Diesel Engines Using Gated Recurrent Unit Networks**  
**G. Alcan**, E. Yilmaz, M. Unel, V. Aran, M. Yilmaz, C. Gurel, K. Koprubasi, *IFAC International Symposium on Advances in Automotive Control (AAC '19), Orléans, France, June 23-27, IFAC-PapersOnLine*, 52 (5) 544-549.
- J7. 2019 **Predicting NOx Emissions in Diesel Engines via Sigmoid NARX Models Using A New Experiment Design for Combustion Identification**  
**G. Alcan**, M. Unel, V. Aran, M. Yilmaz, C. Gurel, K. Koprubasi, *Measurement*, 137, 71-81.
- J6. 2018 **Diesel Engine NOx Emission Modeling Using a New Experiment Design and Reduced Set of Regressors**  
**G. Alcan**, M. Unel, V. Aran, M. Yilmaz, C. Gurel, K. Koprubasi, *IFAC Symposium on System Identification (SYSID '18), IFAC-PapersOnLine*, 51 (15) 168-173.
- J5. 2018 **Biomedical Device Prototype Based on Small Scale Hydrodynamic Cavitation**  
M. Ghorbani, C. Sozer, **G. Alcan**, M. Unel, S. Ekici, H. Uvet, A. Kosar, *AIP Advances*, 8 (3), 035108.
- J4. 2018 **Characterization and Pressure Drop Correlation for Sprays under the Effect of Micro Scale Cavitation**  
M. Ghorbani, **G. Alcan**, A. K. Sadaghiani, A. Mohammadi, M. Unel, D. Gozuacik, A. Kosar, *Experimental Thermal and Fluid Science*, 91, 89-102.
- J3. 2016 **A New Visual Tracking Method for the Analysis and Characterization of Jet Flow**  
**G. Alcan**, M. Ghorbani, A. Kosar, M. Unel, *Flow Measurement and Instrumentation*, 51, 55-67.
- J2. 2016 **Visualization of Microscale Cavitating Flow Regimes via Particle Shadow Sizing Imaging and Vision Based Estimation of the Cone Angle**  
M. Ghorbani, **G. Alcan**, M. Unel, D. Gozuacik, S. Ekici, H. Uvet, A. Sabanovic, A. Kosar, *Experimental Thermal and Fluid Science*, 78, 322-333.
- J1. 2015 **Visualization and Image Processing of Spray Structure Under the Effect of Cavitation Phenomenon**  
M. Ghorbani, **G. Alcan**, D. Yilmaz, M. Unel, A. Kosar, *International Symposium on Cavitation (CAV '15), EPFL, Lausanne, Switzerland, December 6-10, Journal of Physics: Conference Series*, 656, Article No: 012115.

## Book Chapters

- BC1. 2016 **Single Droplet Tracking in Jet Flow**  
**G. Alcan**, M. Ghorbani, A. Kosar, M. Unel, *International Conference on Image Analysis and Recognition (ICIAR '16), Póvoa de Varzim, Portugal, July 13-15, Lecture Notes in Computer Science*, 9730, 415-422.

## Conference Proceedings

- C6. 2021 **Planning for Safe Abortable Overtaking Maneuvers in Autonomous Driving**  
J. Palatti, A. Aksjonov, **G. Alcan**, V. Kyrki, *IEEE International Conference on Intelligent Transportation, (ITSC '21)*, Indianapolis, United States, September 19-22.
- C5. 2020 **Driver Evaluation in Heavy Duty Vehicles Based on Acceleration and Braking Behaviors**  
M. E. Mumcuoglu, **G. Alcan**, M. Unel, O. Cicek, M. Mutluergil, M. Yilmaz, K. Koprubasi, *Annual Conference of the IEEE Industrial Electronics Society, (IECON '20)*, Singapore, October 18-21.

## Summer Internship

### Mercedes-Benz Turk

2012 - Summer Internship

**Project:** Designing an automated drilling machine with Siemens PLC Systems and programming by ladder logic

### Samet R&D

2012 - Summer Internship

**Project:** Designing a mobile line following robot used in the transportation of Raw Materials between designated stations

## Skills

Development Languages:

C++ Python C C#

Ladder Logic

Development Tools:

Tensorflow PyTorch

MATLAB/Simulink

ROS OpenCV

Development Boards:

dSPACE Quanser Q8

STM32F4-Discovery

Raspberry Pi PLC

Personal Interest:

Adobe Photoshop

Adobe Illustrator

Adobe Premiere Pro

## Hobbies

Web Design

2D/3D Graphics Design

Travelling Photography

Swimming Sailing

## Personal Strengths

Problem Solver Motivator

Leader Team Work

Responsibility Ambition

- C4. 2019 **Driving Behavior Classification Using Long Short Term Memory Networks**  
M. E. Mumcuoglu, **G. Alcan**, M. Unel, O. Cicek, M. Mutluergil, M. Yilmaz, K. Koprubasi, *International Conference of Electrical and Electronic Technologies for Automotive, (AEIT AUTOMOTIVE '19)*, Torino, Italy, July 2-4.
- C3. 2017 **Design, Prototyping and Control of a Flexible Cystoscope for Biomedical Applications**  
C. Sozer, M. Ghorbani, **G. Alcan**, H. Uvet, M. Unel, A.Kosar, *International Conference on Mechanics and Mechatronics Research, (ICMMR '17)*, Xi'an, China, June 20-24.
- C2. 2017 **Robust Hovering Control of a Quadrotor using Acceleration Feedback**  
**G. Alcan**, M. Unel, *International Conference on Unmanned Aircraft Systems, (ICUAS '17)*, Miami, Florida, USA, June 13-16.
- C1. 2015 **Vision Based Cone Angle Estimation of Bubbly Cavitating Flow and Analysis of Scattered Bubbles using Micro Imaging Techniques**  
**G. Alcan**, M. Ghorbani, A. Kosar, M. Unel, *Annual Conference of the IEEE Industrial Electronics Society, (IECON '15)*, Yokohama, Japan, November 9-12.

## Honors and Awards

- 2015 – 2019 Sabanci University Full Scholarship for Ph.D. Education
- 2016 Elginkan Foundation Technology Award  
<https://gazetesu.sabanciuniv.edu/2016-04/sutaba-elginkan-vakfi-teknoloji-odulu>
- 2013 – 2016 Research Scholarship from the Scientific and Technological Research Council of Turkey (TUBITAK) (Grant No: 113S092)
- 2012 – 2013 Sakip Sabanci Encouragement Scholarship for superior achievement
- 2006 – 2007 Ranking 34<sup>th</sup> among 300 participants in Mathematic Competition organized by Sabanci University Mathematic Club

## Extra-Curricular Activities

- 2021 – ... Coordinator of Aalto Center for Autonomous Systems  
<https://acas.fi/>
- 2017 – 2018 Participating in Major Fest activities of Sabanci University as valunteer to introduce Mechatronics Program to undergraduate students
- 2012 – 2013 General Coordinator of Sabanci University Robotic Club (SURK)
- 2011 Participating in RoboCup 2011 Istanbul, Turkey
- 2010 – 2012 Student Union, Reporter of WEB / IT, Sabanci University
- 2009 – 2013 Member of Sailing Club (SUSAIL), Sabanci University  
*Taking 32 hours practical and theoretical lessons about sailing*
- 2009 – 2013 Member of Computer Club, Sabanci University
- 2008 – ... Member of Make a Wish Association, Akbank
- 2008 – 2009 Civic Involvement Project named "Make a Wish Association Project"

## References

References are available upon request.