



## Summer Internships for MSc&PhD Students 2022

Company	Project
Medtronic	<a href="#"><u>Deep learning and computer vision intern</u></a>
AMAZON	<a href="#"><u>Applied Science Intern In Alexa Shopping Research</u></a>
IBM Research Lab	<a href="#"><u>Cloud, Security, Drone Technologies, Quantum, AI Applied Science, AI Language</u></a>
TOGA Networks	<a href="#"><u>Deep Learning Algorithms Intern</u></a>
BOSCH	<a href="#"><u>Cable Guiding Robots</u></a>
BOSCH	<a href="#"><u>Self-Tuning Simulations: Minimizing the Sim2Real Gap in Off-road Autonomous Driving</u></a>
BOSCH	<a href="#"><u>Perception for Off-Road Autonomous Driving</u></a>
BOSCH	<a href="#"><u>Offline RL for Off-road Autonomous Driving</u></a>
BOSCH	<a href="#"><u>Goal-Driven Robotic Grasping</u></a>
BOSCH	<a href="#"><u>General Internship Positions at Bosch</u></a>
BOSCH	<a href="#"><u>Computer Vision Logistics</u></a>
BOSCH	<a href="#"><u>Closing the Sim-to-Real Gap by Learning Simulation Parameters</u></a>
BOSCH	<a href="#"><u>Sim-to-Real Using Offline Data</u></a>
BOSCH	<a href="#"><u>RL for Optimal Charging of Electric Vehicle Battery</u></a>
BOSCH	<a href="#"><u>Modeling Interactions With Graph Neural Networks for Motion Forecasting</u></a>
BOSCH	<a href="#"><u>Researcher for Security, Privacy, and Trusted Execution Environments (TEEs) for Distributed Automotive Applications</u></a>
BOSCH	<a href="#"><u>Researcher for privacy, security and Trusted Execution Environments (TEEs) for automotive applications</u></a>

# MEDTRONIC

## Internship opportunity at Medtronic Visualization group: Deep learning and computer vision intern

**Job description:** At Medtronic, we believe in the power of medical technology to improve lives. As an intern in the Visualization group, you will join an interdisciplinary team focusing on novel imaging-based applications for surgeries. You will work on cutting-edge AI technology, revolutionizing the way healthcare is delivered.

Hands-on development of AI-based video-analytics algorithms for medical applications, including classification and segmentation of objects, scene understanding and integration of AI applications in a real-time imaging pipeline.

### Requirements:

1. Studying towards an MSc or a PhD degree in Computer Science with GPA>90. Excellent 4<sup>th</sup> year undergraduate students may apply as well.
2. Hands-on experience in:
  - a. Deep learning and computer vision.
  - b. Python programming.
  - c. PyTorch (preferred) or TensorFlow.

### Nice to have:

1. Research related to deep learning or computer vision.
2. Hands-on experience in:
  - a. Medical imaging.
  - b. NVIDIA GPU programming.

**Location:** Petah Tikva/Yokneam/Home (flexible)

**Duration:** 3 months (part time, possibility for extension)

**Contact details:** [rami.cohen@medtronic.com](mailto:rami.cohen@medtronic.com)



# Amazon

## Applied Science Intern in Alexa Shopping Research

**Job description:** As a Science Intern in the Alexa Shopping Research team, you will work with top researchers and engineers to explore and devise new AI technologies to predict and satisfy the needs of Alexa's (Amazon voice assistant) users. During your internship you will research and implement new technologies related to machine learning, including deep learning, search and NLP and will aim at submitting your results to a top research conference. Ideally, you are enrolled in a PhD program, have strong CS foundations, solid programming skills, have already published at a peer-reviewed conference, and have already some expertise in one or several of the following areas: Information Retrieval, Web data mining, Machine Learning, Natural Language Processing, Computer Vision, Speech, or Artificial Intelligence in general.

### Requirements:

#### BASIC QUALIFICATIONS

- Second year MSc in Computer Science, or related field.
- Submitted a research paper to a top conference.
- Strong CS foundations (data structures and algorithms).
- Proficiency in at least one programming language such as C/C++, Java, or Python.
- Good writing and verbal English skills.

#### PREFERRED QUALIFICATIONS

- PhD candidate in Computer Science, or related field
- Knowledge of AI-related technologies (e.g., Machine Learning, Deep Learning, Natural Language Processing, Information Retrieval, Computer Vision) and cloud technologies (e.g., AWS)
- Excellent communication and collaboration skills.

Apply at [www.amazon.jobs](https://www.amazon.jobs)



TECHNION



COMPUTER SCIENCE  
DEPARTMENT

## IBM Research lab

Cloud, Security, Drone Technologies, Quantum, AI Applied  
Science, AI Language

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search=Summer](https://www.ibm.com/il-en/employment/#jobs?experience=Intern&job-category=All&search=Summer)



# Toga Networks (Huawei)

## Deep Learning Algorithms Intern

**Job description:** Intern position (2 days a week) for innovative algorithmic research and hands-on PoC (proof of concept) developments of Huawei's unique cutting-edge autonomous driving technologies. Focus on sensing and low level vision sides. Such as video ISP, fusion of multi-modality detectors & self – supervised methods. Research of new technologies and papers publications.

### Requirements:

- Student for M.sc. or Ph.D in Computer Science / Electrical Engineer / or similar fields from a leading institution.
- Experience with deep learning research (academy or industry)

### Advantage

- Experience in the industry from relevant ADS / ADAS Companies
- Experience with cameras technologies such as Image or Video Processing / Real Time 3A algorithms / camera's ISP (Video / Image) algorithms
- Background in image processing / computer vision
- Background in depth sensors technologies such as LiDAR and / or unique imaging cameras such as non-RGB cameras and / or other detectors used in the automotive industry
- Relevant academic publications in leading conferences / journals

**Contact details:** [inbal.klebanov@toganetworks.com](mailto:inbal.klebanov@toganetworks.com)



# BOSCH

## Cable Guiding Robots

### Job description:

Do you care about impact on people? Do you want to publish your work in top tier-1 conferences? [Bosch Center for Artificial Intelligence](#) in Israel is a unique place that researches and implements cutting edge technologies for **manufacturing, automotive, robotics, and industrial applications**.

We are looking for an **AI Person** to tackle the challenge of training SOTA robots to manipulate cables in assembly lines. A key aspect of this challenging problem is the incorporation of **AI** into the robotic domain using both Computer Vision and general Machine Learning methods. Your work will combine **theoretical research** and **Practical Research**.



**Goal:** (1) Have impact on product, (2) Write patents, and (3) Publish the work in leading venues such as NeurIPS, ICML, ICCV, ECCV, CVPR, ICRA, IROS, ICLR, RSS, etc.

### Requirements:

- Currently pursuing (or completed) a degree in **PhD** or **MsC** in one of the following areas:
  - Reinforcement Learning
  - Planning and ML
  - Control and ML
  - Deep Learning

Strong competency in **Python** and **Deep Learning** frameworks.

### Contact details:

Oren Spector, [oren.spector@il.bosch.com](mailto:oren.spector@il.bosch.com), +972 52-471-5460

Dotan Di Castro, [dotan.dicastro@il.bosch.com](mailto:dotan.dicastro@il.bosch.com), +972-52-8312220

**Location:** Bosch Israel offices in Matam, Haifa, Israel

**Duration:** Internship for 5-12 months

**Haifa Team Website:** <https://dotd.github.io/>



# BOSCH

## Self-Tuning Simulations: Minimizing the Sim2Real Gap in Off-road Autonomous Driving

### Job description:

Do you care about impact on people? Do you want to publish your work in top tier-1 conferences? [Bosch Center for Artificial Intelligence](#) in Israel is a unique place that researches and implements cutting edge technologies for **manufacturing, automotive, robotics, and industrial applications**.

### Internship Description

You will work on minimizing the gap between a simulation and real data for autonomous off-road trajectory planning. Specifically, you will work on novel techniques for improving the simulation used for training RL agents to mimic the real world.

### The goals of the internship

- Make impact on the Autonomous Dozer project
- Write related patents
- Publish the work in leading venues such as NeurIPS, ICML, ICCV, ECCV, CVPR, ICRA, IROS, ICLR, RSS, etc.

### Requirements:

- Knowledge in Machine Learning, and at least one of the following:
  - Reinforcement Learning
  - Computer Vision.
- Strong competency in **Python** and **Deep Learning** frameworks.
- Good SW engineering capabilities.
- Good academic records.

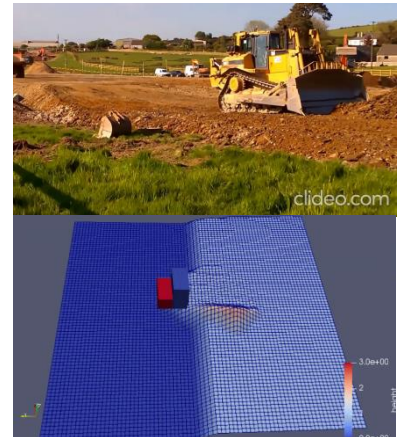
### Contact details:

- Chana Ross, [chana.ross@il.bosch.com](mailto:chana.ross@il.bosch.com), +972-58-566-2000
- Dotan Di Castro, [dotan.dicastro@il.bosch.com](mailto:dotan.dicastro@il.bosch.com), +972-52-8312220

**Location:** Bosch Israel offices in Matam, Haifa, Israel

**Duration:** Internship for 5-12 months

**Haifa Team Website:** <https://dotd.github.io/>





# BOSCH

## Perception for Off-Road Autonomous Driving

### Job description:

Do you care about impact on people? Do you want to publish your work in top tier-1 conferences? [Bosch Center for Artificial Intelligence](#) in Israel is a unique place that researches and implements cutting edge technologies for **manufacturing, automotive, robotics, and industrial applications**.

### Internship Description

You will work on creating a novel approach for correcting a **depth point cloud** of terrain given from real world data and used as an input for **RL trajectory planning algorithms**. Specifically, you will work on novel techniques for improving the noisy, sparse point cloud which includes uncertainty so that the RL agent can plan optimal trajectories for the vehicle in the real world.



### The goals of the internship

- Make impact on the Autonomous Dozer project
- Write related patents
- Publish the work in leading venues such as NeurIPS, ICML, ICCV, ECCV, CVPR, ICRA, IROS, ICLR, RSS, etc.

### Requirements:

- Learning towards a PhD or MSc in CS/EE/ME or other equivalent degree.
- Knowledge in Machine Learning, and at least one of the following:
  - Reinforcement Learning
  - Computer Vision.
- Strong competency in **Python** and **Deep Learning** frameworks.
- Good SW engineering capabilities.
- Good academic records.

### Nice to have:

- Experience in Offline RL.
- Experience conducting experiments on real environments with robots.

### Contact details:

Chana Ross, [chana.ross@il.bosch.com](mailto:chana.ross@il.bosch.com), +972-58-566-2000

Dotan Di Castro, [dotan.dicastro@il.bosch.com](mailto:dotan.dicastro@il.bosch.com), +972-52-8312220

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# BOSCH

## Offline RL for Off-road Autonomous Driving

### Job description:

Do you care about impact on people? Do you want to publish your work in top tier-1 conferences? [Bosch Center for Artificial Intelligence](#) in Israel is a unique place that researches and implements cutting edge technologies for **manufacturing, automotive, robotics, and industrial applications**.

### Internship Description

You will work on improving **Offline Reinforcement Learning** algorithms for **off-road autonomous vehicles**. Specifically, you will work on novel techniques for choosing the data to be collected at each round and improve the offline algorithms using this data.



### The goals of the internship

- Carry out experiments in simulation or real robot to validate approach
- Write related patents
- Publish the work in leading venues such as NeurIPS, ICML, ICCV, ECCV, CVPR, ICRA, IROS, ICLR, RSS, etc.

### Requirements:

#### Nice to have:

- Experience in Offline RL.
- Experience conducting experiments on real environments with robots.

#### Qualifications

- Learning towards a PhD or MSc in CS/EE/ME or other equivalent degree.
- Knowledge in Machine Learning, and at least one of the following:
  - Reinforcement Learning
  - Computer Vision.
- Strong competency in **Python** and **Deep Learning** frameworks.
- Good SW engineering capabilities.
- Good academic records.

### Contact details:

Chana Ross, [chana.ross@il.bosch.com](mailto:chana.ross@il.bosch.com), +972-58-566-2000

Dotan Di Castro, [dotan.dicastro@il.bosch.com](mailto:dotan.dicastro@il.bosch.com), +972-52-8312220

**Location:** Bosch Israel offices in Matam, Haifa, Israel

**Duration:** Internship for 5-12 months

**Haifa Team Website:** <https://dotd.github.io/>



# BOSCH

## Goal-Driven Robotic Grasping

### Job description:

Do you care about impact on people? Do you want to publish your work in top tier-1 conferences? [Bosch Center for Artificial Intelligence](#) in Israel is a unique place that researches and implements cutting edge technologies for **manufacturing, automotive, robotics, and industrial applications**.

### Internship Description

Goal-driven grasping refers to the task of picking a particular object and placing it in some target location and possible orientation. Some form of visual representation (images, point clouds, mesh files) of the object is assumed to be available and can be used for the grasp prediction from real-time images from the scene. The grasping must be aware of the target placing. Motivating examples for this setup could be picking an assembly part and placing it in a desired pose for assembly or picking some product and placing it on a shelf or in some container.



### The goals of the internship

- Survey relevant papers and summarize settings, pros and cons
- Pick most relevant approach and experiment with code
- Propose a novel approach for improving the pick and place
- Carry out experiments in simulation or real robot to validate approach
- Publish the work in leading venues such as NeurIPS, ICML, ICCV, ECCV, CVPR, ICRA, IROS, ICLR, RSS, etc.

### Requirements:

- Learning towards a PhD or MSc in CS/EE/ME or other equivalents degree.
- Knowledge in Machine Learning, and at least one of the following:
  - Reinforcement Learning
  - Computer Vision.
- Strong competency in Python and Deep Learning frameworks.
- Good SW engineering capabilities.
- Good academic records.

### Nice to have:

- Knowledge in motion planning, control.
- Knowledge in ROS (Robot Operation System).

### Contact details:

Zohar Feldman, [zohar.feldman@il.bosch.com](mailto:zohar.feldman@il.bosch.com), +972 54-237-0708

Dotan Di Castro, [dotan.dicastro@il.bosch.com](mailto:dotan.dicastro@il.bosch.com), +972-52-8312220

**Location:** Bosch Israel offices in Matam, Haifa, Israel

**Duration:** Internship for 5-12 months

**Haifa Team Website:** <https://dotd.github.io/>



# BOSCH

## General Internship Positions at Bosch

### Job description:

Do you care about impact on people?

Do you want to publish your work in top tier-1 conferences?

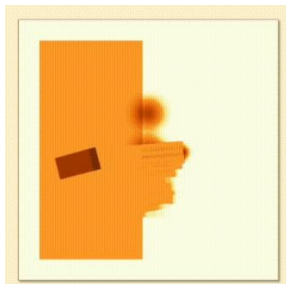
[Bosch Center for Artificial Intelligence](#) in Israel is a unique place that researches and implements cutting edge technologies for **manufacturing, automotive, robotics, and industrial applications**. We are looking for **Reinforcement Learning, Planning, Control, Computer Vision, and Machine Learning** experts for various projects. If such things interest you, then Bosch Israel is looking forward to your application!

### Requirements:

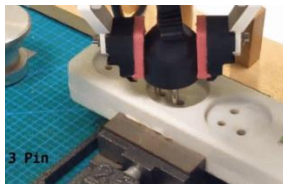
- Currently pursuing (or completed) a degree in **PhD** or **MsC** in one of the following areas:
  - Reinforcement Learning, Planning and ML, Control and ML
  - Deep Learning and Computer vision
  - Any related field
- Strong competency in **Python** and **Deep Learning** frameworks.
- Self-confident and responsible team player with excellent communication skills

### Examples of Projects

Autonomous Dozer



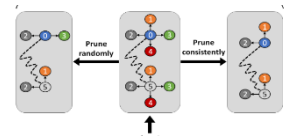
Robotic Arms



Vision for Vehicles



Graph NN



### Job Description

**Create something new:** As a leading research scientist, you define a research agenda for an AI research field and conduct excellent research on real-world projects. The results should (1) be published at the leading AI venues and / or (2) transferred for implementation in Bosch products.

### Further references

Examples of papers created during an internship at BCAI

- S. Di Castro Shashua, S. Mannor, D. Di Castro. "Sim and Real: Better Together". **NeurIPS 2021**.
- J. Oren, C. Ross, M. Lefarov, F. Richter, A. Taitler, Z. Feldman, D. Di Castro, C. Daniel. "SOLO: Search Online, Learn Offline for Combinatorial Optimization Problems". **SOCS, 2021**.
- O. Spector, D. Di Castro. "InsertionNet - A Scalable Solution for Insertion". **IROS 2021, RAL 2021**.
- E. Kosman, D. Di Castro. "Vision-Guided Forecasting--Visual Context for Multi-Horizon Time Series Forecasting". *arXiv preprint arXiv:2107.12674, 2021*. **Presentation at IMVC 2021**
- Botach, Y. Feldman, Y. Miron, Y. Shapiro, D. Di Castro. "BIDCD-Bosch Industrial Depth Completion Dataset". *arXiv preprint arXiv:2108.04706*

**Contact details:**

Dr. Dotan Di Castro, [dotan.dicastro@bosch.com](mailto:dotan.dicastro@bosch.com), +972-52-8312220

**Location:** Bosch Israel offices in Matam, Haifa, Israel

**Duration:** Internship for 4-12 months

**Haifa Team Website:** <https://dotd.github.io/>

# BOSCH

## Computer Vision for Logistics

### Job description:

Do you care about impact on people? Do you want to publish your work in top tier conferences? [Bosch Center for Artificial Intelligence](#) in Israel is a unique place that researches and implements cutting edge technologies for **manufacturing, automotive, robotics, and industrial applications**.

### Internship Description

Our goal is to improve object segmentation for unseen objects, in industrial and logistic applications. Candidates can pick one of the following topics.

- Improve generalization for unseen classes, e.g. by learning hybrid clustering and deep embedding models.
- Unsupervised or partially supervised object-segmentation learning.
- Segmentation and depth-completion for transparent objects.
- Next-Best-View-Estimation, for a robot mounted camera. Learn to move a camera on a minimal trajectory that maximizes accuracy and/or confidence.

### The goals of the internship

- Survey relevant papers and summarize settings, pros and cons
- Pick most relevant approach and experiment with code
- Propose a novel approach and carry out experiments
- Publish the work in leading venues such as ECCV, CVPR, ICRA, etc.

### Requirements:

- Learning towards a PhD or MSc in CS/EE/ME or other equivalent degree.
- Knowledge in Machine Learning, and preferably also in Computer Vision.
- Strong competency in Python and Deep Learning frameworks.
- Good SW engineering capabilities.
- Good academic records.

### Nice to have:

- Knowledge in motion planning, control.
- Knowledge in ROS (Robot Operation System).

### Contact details:

Yoel Shapiro, [yoel.shapiro@il.bosch.com](mailto:yoel.shapiro@il.bosch.com), +972 58-440-0936

Dotan Di Castro, [dotan.dicastro@il.bosch.com](mailto:dotan.dicastro@il.bosch.com), +972-52-8312220

**Location:** Bosch Israel offices in Matam, Haifa, Israel

**Duration:** Internship for 5-12 months

**Haifa Team Website:** <https://dotd.github.io/>





# BOSCH

## Closing the Sim-to-Real Gap by Learning Simulation Parameters

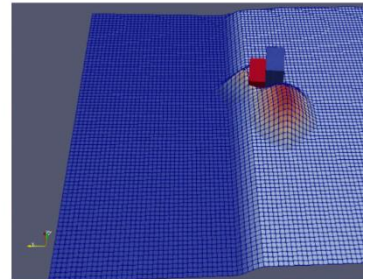
### Job description:

Do you care about impact on people? Do you want to publish your work in top tier-1 conferences? [Bosch Center for Artificial Intelligence](#) in Israel is a unique place that researches and implements cutting edge technologies for **manufacturing, automotive, robotics, and industrial applications**.

### Internship Description

Simulation became a crucial part in many RL algorithms. Many times, the simulation is not tuned correctly to the RL problem in hand. By using data generated from the real task and simulation of the same task in digital twin, we would like automatically make the simulation more meaningful for maximizing the RL algorithm performance. You will

1. Develop the required theory;
2. Show your results on a real task!



### The goals of the internship

- Carry out experiments in simulation or real robot to validate approach
- Write related patents
- Publish the work in leading venues such as NeurIPS, ICML, ICCV, ECCV, CVPR, ICRA, IROS, ICLR, RSS, etc.

### Requirements:

#### Nice to have:

- Experience in Offline RL.
- Experience conducting experiments on real environments with robots.

#### Qualifications

- Learning towards a PhD or MsC in CS/EE/ME or other equivalent degree.
- Knowledge in Machine Learning, and at least one of the following:
  - Reinforcement Learning
  - Computer Vision.
- Strong competency in **Python** and **Deep Learning** frameworks.
- Good SW engineering capabilities.
- Good academic records.

### Contact details:

Dotan Di Castro, [dotan.dicastro@il.bosch.com](mailto:dotan.dicastro@il.bosch.com), +972-52-8312220

**Location:** Bosch Israel offices in Matam, Haifa, Israel

**Duration:** Internship for 5-12 months



Haifa Team Website: <https://dotd.github.io/>

# BOSCH

## Sim-to-Real Using Offline Data

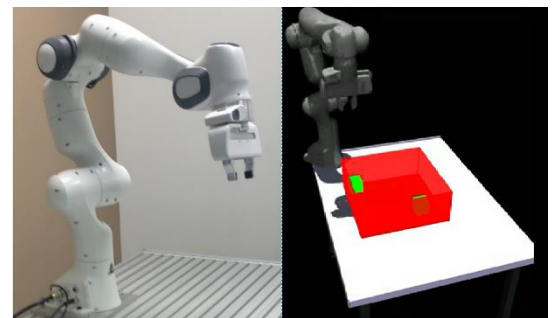
### Job description:

Do you care about impact on people? Do you want to publish your work in top tier-1 conferences? [Bosch Center for Artificial Intelligence](#) in Israel is a unique place that researches and implements cutting edge technologies for **manufacturing, automotive, robotics, and industrial applications**.

### Internship Description

Offline Data in RL is the way to re-use data that was already collected. In this internship we will investigate ways to incorporate off-line data for RL in order to learn faster in simulation real world tasks. You will

1. Develop the required theory;
2. Show your results on a real robotic arm!



### The goals of the internship

- Carry out experiments in simulation or real robot to validate approach
- Write related patents
- Publish the work in leading venues such as NeurIPS, ICML, ICCV, ECCV, CVPR, ICRA, IROS, ICLR, RSS, etc.

### Requirements:

#### Nice to have:

- Experience in Offline RL.
- Experience conducting experiments on real environments with robots.

#### Qualifications

- Learning towards a PhD or MsC in CS/EE/ME or other equivalent degree.
- Knowledge in Machine Learning, and at least one of the following:
  - Reinforcement Learning
  - Computer Vision.
- Strong competency in **Python** and **Deep Learning** frameworks.
- Good SW engineering capabilities.
- Good academic records.

### Contact details:

Dotan Di Castro, [dotan.dicastro@il.bosch.com](mailto:dotan.dicastro@il.bosch.com), +972-52-8312220

**Location:** Bosch Israel offices in Matam, Haifa, Israel

**Duration:** Internship for 5-12 months

Haifa Team Website: <https://dotd.github.io/>





# BOSCH

## RL for Optimal Charging of Electric Vehicle Battery

### Job description:

Do you care about impact on people? Do you want to publish your work in top tier-1 conferences? [Bosch Center for Artificial Intelligence](#) in Israel is a unique place that researches and implements cutting edge technologies for **manufacturing, automotive, robotics, and industrial applications**.



We are looking for **Reinforcement Learning** and **Machine Learning** experts for optimizing EV battery charging, enabling faster charging without shortening battery life. A key aspect of this challenging problem is the incorporation of **offline data**, collected from real batteries, into a simulator-based learning scheme. Your work will combine **theoretical research** with use of real-life data.

### Requirements:

- Currently pursuing (or completed) a degree in **PhD** or **MsC** in one of the following areas:
  - Reinforcement Learning
  - Planning and ML
  - Control and ML
  - Deep Learning

**Strong competency in Python and Deep Learning frameworks.**

### Contact details:

Dr. Orly Avner, [orly.avner@il.bosch.com](mailto:orly.avner@il.bosch.com), +972-54-2408030

Dr. Dotan Di Castro, [dotan.dicastro@il.bosch.com](mailto:dotan.dicastro@il.bosch.com), +972-52-8312220

**Location:** Bosch Israel offices in Matam, Haifa, Israel

**Duration:** Internship for 5-12 months

**Haifa Team Website:** <https://dotd.github.io/>





# BOSCH

## Modeling Interactions with Graph Neural Networks for Motion Forecasting

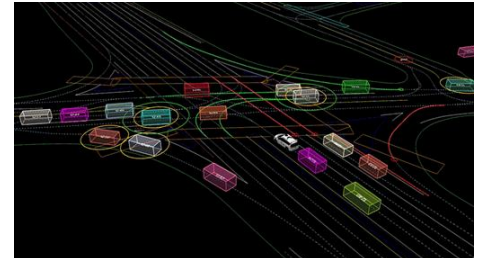
### Job description:

Do you care about impact on people? Do you want to publish your work in top tier-1 conferences? [Bosch Center for Artificial Intelligence](#) in Israel is a unique place that researches and implements cutting edge technologies for manufacturing, automotive, robotics, and industrial applications.

### Internship Description

Predicting the behavior of traffic agents around an autonomous vehicle is one of the key unsolved challenges in reaching full self-driving autonomy. For this purpose, you will work on improving

Time-Series Forecasting algorithms for Motion Forecasting. Specifically, you will work on edge-cutting architectures, such as Graph Neural Networks (GNNs).



### The goals of the internship

- Carry out experiments in simulation or real robot to validate approach
- Write related patents
- Publish the work in leading venues such as NeurIPS, KDD, ICML, ICCV, ECCV, CVPR, ICRA, IROS, ICLR, RSS, etc.

### Requirements:

- Learning towards a PhD or MsC in CS/EE/ME or other equivalents degree.
- Knowledge in Machine Learning, and at least one of the following:
  - Reinforcement Learning
  - Computer Vision.
- Strong competency in Python and Deep Learning frameworks.
- Good SW engineering capabilities.
- Good academic records.

### Nice to have:

- Experience with Graph Neural Networks.
- Experience Time Series Forecasting

### Contact details:

Eitan Kosman, [eitan.kosman@il.bosch.com](mailto:eitan.kosman@il.bosch.com), +972-52-291-9499



Dotan Di Castro, [dotan.dicastro@il.bosch.com](mailto:dotan.dicastro@il.bosch.com), +972-52-8312220

**Location:** Bosch Israel offices in Matam, Haifa, Israel

**Duration:** Internship for 5-12 months

**Haifa Team Website:** <https://dotd.github.io/>

## BOSCH

### Researcher for Security, Privacy, and Trusted Exec Execution Environments (TEEs) for Distributed Automotive Applications

#### Job Description:

The position focuses on **Security and Privacy Enhanced Computing** research as part of an international research team located in Germany and the USA.

- Create something new: bring latest **cloud technology** and security techniques to real world applications.
- Help shape the future: create outstanding solutions for the **automotive industry**.
- Be a trailblazer: Challenge current assumptions create true innovation.

#### Research Scope – PII protection in automotive AI pipelines

Protection of personal identifiable information (PII) in automotive artificial intelligence (AI) pipelines is the focus of this research project managed by Bosch CR. The areas of research involve technologies such as TEEs (e.g. Intel SGX), Machine Learning and Deep Learning (e.g. TensorFlow), as well as cloud-native frameworks (e.g. Kubernetes). The research candidate will be required to design, implement, and practically evaluate ideas and practices that will allow secure, distributed, and efficient solutions.

#Security #ConfidentialComputing #SGX #AutomatedDriving #TEEs #CloudNative #Privacy

#### Requirements:

- Education: Ph.D. or M.Sc. student in Computer Science or similar technical fields
- Experience:
  - Proven expertise in security and/or privacy engineering, trusted execution environments (e.g. Intel SGX), machine learning, and deep learning
  - Expertise in architecture and implementation of Deep Learning pipelines using frameworks such as TensorFlow
  - Expertise in architecture and implementation of containerized, distributed cloud systems such as Docker, Kubernetes, and Kubeflow
  - Knowledge in the areas of IT security, cryptography, network communication, distributed systems, cloud technologies, and a strong interest in further strengthening these
- Personality: good communication and presentation skills, good team player, inter-cultural and cross-domain proficiency
- Working Practice: able to work both independently and in an international team environment, strong analytic mindset and very structured approach
- Languages: strong English language skills

**Contact details:** tal.dekel@bosch.com

Location: Remote/Hybrid Bosch Corporate Research office – Midtown TLV/MATAM Haifa.

Period: 6 months of employment

# BOSCH

## Researcher for privacy, security and Trusted Execution Environments (TEEs) for automotive applications

### Job description:

The position focuses on **Security and Privacy Enhanced Computing** research as part of an international research team located in Germany and the USA.

- ➔ Create something new: bring latest **cloud technology** and security techniques to real world applications.
- ➔ Help shape the future: create outstanding solutions for the **automotive industry**.
- ➔ Be a trailblazer: Challenge current assumptions create true innovation.

### Research Scope

- **Protection of sensitive IP in multi-user cloud-based automated driving simulation environments:**

Design and implement

- Key management and remote attestation for distributed simulation environments, ensuring security at rest of simulation artifacts using cloud native technologies such as Kubernetes.
- Low-level methods to optimize performance of the enclaves within the simulation environment.
- Remote attestation architecture for SiL framework
  - Evaluate current architecture proposal – propose new ideas for improvements
  - PoC Implementation of remote attestation concept and key management
  - Attestation models in a distributed setting (when combining with Kubernetes etc)
- Local attestation for SiL
  - Efficient methods to establish secure bus/communication and control channels
  - PoC for secure RESTbus/communication channels
  - Efficient methods to validate integrity of streaming data over the communication channels
- Performance Optimization
  - Identify sources of overhead in SiL system
  - Developing new methods to minimize performance overhead

- Demonstration and evaluation of performance overhead
- Exploration of alternatives to SGX in context of SiL – AMD, TZ, RISC-V

Optional research: Attack scenario – Illustrate weakness in current SiL encryption tools

#AutomatedDriving, #TrustedComputing, #SGX, #GPUTEES, #CloudNative, #PersonalidentifiableInformation

### **Requirements:**

- Education: Ph.D. or M.Sc. student in Computer Science or similar technical fields
- Experience:
  - Proven expertise in security and/or privacy engineering, trusted execution environments, SGX performance
  - Strong expertise in architecture and implementation of distributed cloud systems; deep familiarity with methods and best practices of data security development including life cycle management and international standards in information security
  - Knowledge in the areas of IT security, cryptography, network communication, distributed systems, cloud technologies and a strong interest in further strengthening these
- Personality: good communication and presentation skills, good team player, inter-cultural and cross-domain proficiency
- Working Practice: able to work both independently and in an international team environment, strong analytic mindset and very structured approach
- Languages: strong English language skills

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