

# Mahdi Dehshiri

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## Education

### University of Tehran

MSc in Electrical and Biomedical Engineering

- GPA: 18.89/20

Tehran, Iran

2021 - Current

### K. N. Toosi University of Technology

BSc in Electrical Engineering - Control Engineering

- GPA: 16.25/20 (2016 - 2021) & 17.69/20 (2018 - 2021)

Tehran, Iran

2016 - 2021

## Research Interests

- Causal structures learning:** causal discovery in the presence of a nonstationary environment, hidden variables, and time-dependent mechanisms.
- Representation learning:** identifiability, causal representation learning, blind source separation.
- Bayesian Statistics:** variational Bayes, bayesian network learning, bayesian causal inference, bayesian neural network.
- Others:** Bayesian non-parametric, time point process, privacy, interpretability.

## Publications

Brain effective connectome based on fMRI and DTI data: Bayesian causal learning and assessment

Abdolmahdi Bagheri, **Mahdi Dehshiri**, Yamin Bagheri, Alireza Akhondi-Asl, Babak Nadjar Araabi

*Plos one* 18.8 (2023) e0289406. Public Library of Science San Francisco, CA USA, 2023

## Research Experience

### Computational Modeling and Machine Learning Lab. at University of Tehran

Research Assistant

Tehran, Iran

2022 - Present

- Research, Implementation, and development on Causal Structure Learning methods e.g. GES, PC(using Kernel-based Conditional Independence Test), Golem, Notears, DAGMA.
- Solid theoretical background with hands-on experience on identifiable representation learning methods e.g. nonlinear ICA, iVAE(identifiable Variational Autoencoder), non-factorized-iVAE, CCL.
- Research and Implementation of domain generalization methods e.g. Causal Matching, SelfReg using domainbed.

### Advanced Robotics and Automated Systems (ARAS) at K. N. Toosi University of Technology

Research Assistant

Tehran, Iran

2021 - 2022

- Sales Prediction of Kalana stores products using Random Forest(Lightgbm) and graphical user interface design(Tkinter) for the program.

### Advanced Process Automation and Control (APAC) at K. N. Toosi University of Technology

Research Assistant

Tehran, Iran

2018 - 2020

- Alarm Management using Bidirectional LSTM for VS.94 Turbine(PyTorch).

## Teaching Experience

### System Identification

Teacher Assistant

University of Tehran

2022

Homework assessment

### Deep Generative Models

Teacher Assistant

University of Tehran

2023

Designing-Assessing Homework & Exam for Causality and PGM section

### Causal Inference and Learning

Lead Teacher Assistant

University of Tehran

2024

Upcoming Teaching Experience

## Honores

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- Among the top 2% of Iranian National B.Sc. entrance exam among 160,000 participants.
- Among the top 15% of Electrical Engineering Students at K. N. Toosi University, Tehran, Iran - 2021.
- Among the top 10% of Electrical and Biomedical Engineering Students at Tehran University - 2023.

## Selected Courses

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### Graduate Courses

- Statistical Machine Learning - 19.7/20
- Machine Learning - 19.5/20
- Deep Learning & PGM - 18/20
- Statistical Inference - 20/20
- Stochastic Processes - 16.3/20
- 6.S091-causality- Informal Course Study

### Under-Graduate Courses

- Fundamentals of Computer Vision - 20/20
- Fundamentals of Intelligent systems - 18.8/20
- Physiology 1 - 19/20
- Linear Algebra - 17.5/20

## Selected Projects

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### Causal discovery

- Brain effective connectome based on fMRI and DTI data using GOLEM & FGES(Tetrad-Java,py-causal), TensorFlow)(code).
- Causal Discovery in the presence of Prior Information using DAGMA(numpy) (code).
- Identifiability of Causal Relations in the presence of non-stationary noise(numpy).

### Causal Represantion learning

- Classification of colored-MNIST Dataset using SCCL(Supervised Casual Contrastive Learning)(PyTorch)(code).
- Implementation of NF-iVAE(PyTorch)(code).

### Statistical machine learning(course)

- Supervised Contrastive Learning & Dirichlet Process Mixture model on 102-Flowers Data(PyTorch) (code).
- Interpretability and Privacy on 102-Flowers Data(PyTorch)(code).
- Open-Set Recognition of 102-Flowers Data(PyTorch)(code).

### Other courses projects

- Sensitivity Analysis and Design of Alarm System Based on Delay Timer Considering Measurement Errors.
- Classification of Names and IDs on Handwritten Pages using Image-Processing & Deep CNN.
- Classification and Clustering of Music Genres.

## Skills

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**Programming** Python, R, C, Matlab

**Miscellaneous** Linux,  $\LaTeX$ (Overleaf),Simulink, Git, Arduino, Microsoft Office

## Languages

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**English** TOEFL in November

**Farsi** Native proficiency

## References

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- Prof. Hamid Soltanian-Zadeh, School of Electrical and Computer Engineering, University of Tehran  
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- Prof. Babak Nadjar Araabi, School of Electrical and Computer Engineering, University of Tehran  
Email: araabi@ut.ac.ir
- Prof. Hamidreza Taghirad, Faculty of Electrical Engineering, K. N. Toosi University of Technology  
Email: Taghirad@kntu.ac.ir
- Dr. Abdolmahdi Bagheri, School of Electrical and Computer Engineering, University of Tehran  
Email: abdolmahdibagheri@ut.ac.ir