Mahdi Dehshiri

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Education

University of Tehran *Tehran, Iran*

MSc in Electrical and Biomedical Engineering *2021 - Current*

- GPA: 18.89/20

K. N. Toosi University of Technology *Tehran, Iran*

BSc in Electrical Engineering - Control Engineering *2016 - 2021*

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

Research Interests

- **Causal structures learning:** Causal discovery in the presence of a nonstationary environment, latent variables, and time-dependent mechanisms.
- **Representation learning:** Identifiability, causal representation learning, blind source separation.
- **Bayesian Statistics:** Variational Bayes, uncertainty estimation, Bayesian experimental design.
- **Domain generalization, Causal inference, Interpretability, Bayesian non-parametric, Temporal point process.**

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 *Tehran , Iran*

Research Assistant *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 *Tehran , Iran*

Research Assistant *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 *Tehran , Iran*

Research Assistant *2018 - 2020*

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

Teaching Experience

Causal Inference and Learning *University of Tehran*

Lead Teacher Assistant *2024*

Upcoming Teaching Experience

Deep Generative Models *University of Tehran*

Teacher Asistant *2023*

Designing-Assessing Homework & Exam for Causality and PGM section

System Identification *University of Tehran*

Teacher Asistant *2022*

Homework assessment

Honores

- 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

Graduate Courses

- Statistical Machine Learning - 19.7/20
- Machine Learning - 19.5/20
- Deep Learning & PGM - 18/20
- System Identification - 19/20
- Statistical Inference - 20/20
- Functional brain Imaging Systems - 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 and Anatomy - 19/20
- Linear Algebra - 17.5/20

Selected Projects

Causal structure learning

- 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).

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

Programming Python, R, C, Matlab
Miscellaneous Linux, LaTeX(Overleaf),Simulink, Git, Arduino, Microsoft Office

Languages

English TOEFL in November
Farsi Native proficiency

References

- Babak Nadjar Araabi, Professor at School of Electrical and Computer Engineering, University of Tehran
  Email: araabi@ut.ac.ir
- Hamidreza Taghirad, Professor at Faculty of Electrical Engineering, K. N. Toosi University of Technology
  Email: Taghirad@kntu.ac.ir
- Mostafa Tavassolipour, Professor at School of Electrical and Computer Engineering, University of Tehran
  Email: tavassolipour@ut.ac.ir