

# Mert Onur Cakiroglu

PHD STUDENT · COMPUTER SCIENCE

Indiana University, Luddy School of Informatics, Computing, and Engineering  
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## Research Interests

My research focuses on the intersection of machine learning, temporal data, video learning, and representation learning. I develop advanced models to improve video understanding, particularly in compressed domains and through self-supervised techniques. Additionally, I explore novel methods for representing low-dimensional sequential data, such as protein sequences and univariate time series, using de Bruijn graphs to enhance model performance in classification and forecasting tasks.

## Education

### Indiana University, Luddy School of Informatics, Computing, and Engineering

PHD COMPUTER SCIENCE

- **Advisor:** Prof. Dr. Mehmet M Dalkilic
- **Co-Advisor:** Dr. Hasan Kurban

Bloomington, Indiana

Fall 2023 – present

### TOBB University of Economics and Technology

BS COMPUTER SCIENCE

Ankara, Turkey

2017 – 2021

## Publications

### CONFERENCES

**Mert Onur Cakiroglu**, Hasan Kurban, Elham Khorasani Buxton, Mehmet Dalkilic (2024). *A Novel Discrete Time Series Representation with De Bruijn Graphs for Enhanced Forecasting Using TimesNet (Extended Abstract)*. 2024 IEEE 11th International Conference on Data Science and Advanced Analytics (DSAA), San Diego, CA, USA, pp. 1-3.

### PEER REVIEWED JOURNALS

**Mert Onur Cakiroglu**, Hasan Kurban, Parichit Sharma, M. Oguzhan Kulekci, Elham Khorasani Buxton, Maryam Raeeszadeh-Sarmazdeh, Mehmet Dalkilic (2024). *An Extended De Bruijn Graph for Feature Engineering Over Biological Sequential Data*. Machine Learning: Science and Technology (**Impact Factor: 6.8**)

**Mert Onur Cakiroglu**, Hasan Kurban, Elham Khorasani Buxton, Mehmet Dalkilic. (2024). *A Reinforcement Learning Approach to Effective Forecasting of Pediatric Hypoglycemia in Diabetes I Patients: an extended de Bruijn Graph*. Nature – Scientific Reports (**Impact Factor: 3.8**)

**Mert Onur Cakiroglu**, Hasan Kurban, Elham Khorasani Buxton, Mehmet Dalkilic (2024). *A Novel Discrete Time Series Representation with De Bruijn Graphs for Enhanced Forecasting Using TimesNet* - Machine Learning Journal (Under Review)

## Research Experience

### Texas A&M University at Qatar – Temporary Research Associate

ADVISOR: DR. HASAN KURBAN

Doha, Qatar

May. 2024 – Jul. 2024

- Developing a self-supervised learning framework for video data, enabling the model to learn meaningful representations without labeled data, improving video understanding tasks such as classification and segmentation.
- Implementing federated video learning in the compressed domain, optimizing the model's performance while preserving user privacy and reducing communication overhead in distributed learning environments.

## Student Researcher – Kurban Intelligence Labs

ADVISOR: DR. HASAN KURBAN

Aug. 2023 – Ongoing

- **Machine Learning Research**

Conducting research on video learning, self-supervised learning, and representation learning with de Bruijn graphs.

Laboratory Website: [kurbanintelligencelab.com](http://kurbanintelligencelab.com)

## Work Experience

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### Innova IT Solutions

FULL-STACK SOFTWARE DEVELOPER

Jul. 2021 – Apr. 2023

- Contributed to the development of the "Centralized Fault Management System (MARS)," designed to provide end-to-end fault detection, diagnosis, and resolution for telecommunication networks and IT infrastructures.
- Improved legacy codebase and developed new functionalities based on functional specifications and business requirements.
- Gained experience working in an agile development environment.
- Developed microservices using Spring Boot, interacting with PL/SQL and MongoDB databases in a microservice architecture.
- Worked on front-to-backend interactions using React.js and Vaadin frameworks, utilizing RESTful services for seamless integration.
- *Project Website:* <https://www.innova.com.tr/en/centralized-fault-management-system-mars>

### CSCI-C 200 Introduction to Computers and Programming

ASSOCIATE INSTRUCTOR (TA)

Spring 2023 – Ongoing

- Instructor: Prof. Dr. Mehmet M Dalkilic

## Awards and Recognition

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2023      **Fall 2023 Luddy Doctoral Associate Instructor Fellowship**, Luddy School of Informatics, Computing, and Engineering