

# Mert Onur Cakiroglu

PHD STUDENT · COMPUTER SCIENCE

Indiana University, Luddy School of Informatics, Computing, and Engineering  
700 N Woodlawn Ave, Bloomington, IN 47408

✉ meocakir@iu.edu | 🏠 mert.it.com | 📧 Lumpus99 | 🌐 mert-onur-cakiroglu

## 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

### PEER REVIEWED CONFERENCE PROCEEDINGS

**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). IEEE International Conference on Data Science and Advanced Analytics (DSAA 2024) - Machine Learning Journal Track

### 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 Journal

**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: Science and Technology* (Under Review)

**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* (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)

## **Awards and Recognition**

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