

Friday, June 28, 2024 at 10:01:13 Eastern Daylight Time

Subject: Dissertation Defense - Aliye Hashemi, PHD Bioinformatics & Computational Biology
Date: Tuesday, June 25, 2024 at 12:27:05 PM Eastern Daylight Time
From: SSB Faculty List on behalf of Diane St. Germain
To: SSB-FACULTY-LIST-L@LISTSERV.GMU.EDU

Dissertation Defense Announcement
To: The George Mason University community
Candidate: Aliye Sadat Hashemi
Program: PhD Bioinformatics & Computational Biology

Date: Tuesday, July 9, 2024

Time: 10:00 AM Eastern Time (US and Canada)

Location: Via Zoom

All are invited to attend the defense.

Join Zoom Meeting

<https://gmu.zoom.us/j/99758881338>

Meeting ID: 997 5888 1338

One tap mobile

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Join by SIP

99758881338@zoomcrc.com

Committee Chair: Dr. Iosif Vaisman

Committee Members: Dr. Ancha Baranova and Dr. Dmitri Klimov

Title: "Topology-Based Protein Classification Using Deep Learning"

Abstract:

Utilizing Artificial Intelligence (AI) in computational biology techniques could offer significant advantages in alleviating the growing workloads faced by structural biologists, especially with the emergence of big data. This study serves as a proof of concept, demonstrating how Delaunay tessellation and deep learning models can be

used to classify proteins with high accuracy into superfamilies and potentially families, based on the local arrangement of neighboring residues. We employed Delaunay tessellation as a promising method to obtain the overall structural topology of proteins. Subsequently, we developed multi-class deep neural network models to classify protein superfamilies based on their topology. Our models achieved a best accuracy of approximately 0.92 in classifying proteins into 18 well-populated superfamilies. This result suggests that the deep learning models developed in this research have successfully captured complex patterns within protein topology.

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