

Bahçeşehir University, Istanbul, Türkiye  
Analysis & PDE Center, Ghent University, Ghent, Belgium  
Institute Mathematics & Math. Modeling, Almaty, Kazakhstan

## “Analysis and Applied Mathematics”

Weekly Online Seminar

### Seminar leaders:

Prof. Allaberen Ashyralyev (BAU, Istanbul),  
Prof. Michael Ruzhansky (UGent, Ghent),  
Prof. Makhmud Sadybekov (IMMM, Almaty)

Date: **Tuesday, January 14, 2025**

Time: 14.00-15.00 (Istanbul) = 12.00-13.00 (Ghent) = 16.00-17.00 (Almaty)

Zoom link: <https://us02web.zoom.us/j/6678270445?pwd=SFNmQUlvT0tRaHlDa-VYrN3l5bzJVQT09>, **Conference ID:** 667 827 0445, **Access code:** 1

### Speaker:

**AL Hussein Basil Yaseen Alhllawi**  
*Near East University, Nicosia, North Cyprus*

**Title: Ensemble deep learning models for the classification of atopic and seborrheic dermatitis**

Abstract: Atopic dermatitis (AD) and seborrheic dermatitis (SD) are two multifactorial skin conditions classified as internal dermatitis, each exhibiting distinct clinical, epidemiological, and pathological characteristics. However, their similar appearance presents a significant challenge in automatic classification using lesion images. In this study, we employed advanced deep learning models and machine learning algorithms to address this issue. We utilized Google’s InceptionV3, introduced in 2015, known for its robust image classification performance, along with a custom Convolutional Neural Network (CNN) specifically designed for our dataset. ResNet50, a highly efficient model developed by Microsoft Research Asia in 2016, was also applied, as well as DenseNet (introduced in 2017 by the University of Oxford) and MobileNet (introduced in 2017 by Google). To evaluate the models' performance, metrics such as accuracy, sensitivity, specificity, precision, and F-score were calculated. The detection accuracy of the models was as follows: 95.49% for the ensemble model combining InceptionV3, ResNet50, and DenseNet; 93.61% for the ensemble model combining InceptionV3 and ResNet50; 91.21% for InceptionV3; 81.90% for MobileNet; 80.50% for DenseNet; and 70.35% for CNN. Streamlit was used to deploy the program, providing an interactive user interface to facilitate the image classification process.

### Biography:

**Al-Hussein Al-Halawi** is a master's student in Artificial Intelligence Department at the Near East University. He has finished his Bachelor's degree in Software Engineering Depart-

ment from NEU in 2022. His research focuses on cutting-edge areas such as machine learning, deep learning, image processing, and data analysis. He is particularly skilled in developing web-based solutions that integrate model results. He recently submitted a research article titled 'Unsupervised and Supervised Machine Learning Methods for Customer Personality Analysis' to 7th International Conference on Analysis and Applied Mathematics (ICAAM-2024).