"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 7, 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=SFNmQUIvT0tRaHlDa-VYrN3l5bzJVQT09, **Conference ID:** 667 827 0445, **Access code:** 1

Speaker:
Assoc. Prof. Dr. Ali Turab
Northwestern Polytechnical University, China

Title: **The computational analysis of animal behavior using machine learning and mathematical modeling**

Abstract: This study explores the complexities of animal decision-making in T-maze environments by integrating computational modeling with machine learning techniques. Specifically, it focuses on the binary decision-making process in T-mazes, examining how animals choose between two paths. Our research employs a mathematical model designed to capture the decision-making behavior of fish, providing analytical insights into their intricate behavioral patterns. Additionally, advanced machine learning algorithms are utilized to analyze behavioral data from zebrafish and rats. The combination of these techniques yields high predictive accuracies, demonstrating the effectiveness of computational methods in decoding animal behavior in controlled experiments. This study enhances our understanding of animal cognitive processes and underscores the crucial role of computational modeling and machine learning in advancing behavioral science.

Biography:
Dr. Ali Turab is an Associate Professor at Northwestern Polytechnical University (NPU), China. He earned his Ph.D. in Applied Mathematics from Thammasat University, Thailand, and has previously worked as a postdoctoral fellow and research associate at leading institutions. His research spans mathematical modeling, machine learning, behavioral analysis, game theory, and nonlinear analysis, with applications in life sciences and interdisciplinary studies. Dr. Turab has published extensively in high-impact journals and is passionate about advancing innovative solutions to real-world problems through mathematics and computational science.