НАЦИОНАЛЕН СЕМИНАР ПО СТОХАСТИКА

секция „Изследване на операциите, вероятности и статистика"

Поредната сбирка на *Националния семинар по стохастика* ще се проведе на **29 юни 2022** г. (сряда) от **14:00** часа в зала **503** на ИМИ-БАН. Доклад на тема:

"Modelling longitudinal cognitive test data with ceiling effects and left skewness"

ще изнесе Деница Григорова (ФМИ - СУ), съвместна работа с Деян Палежев и Ралица Георгиева.

Abstract: Cognitive tests are among the markers for the development of cognitive diseases such as Alzheimer's disease. We model the scores from the Mini Mental State Examination (MMSE) over time on data from the Alzheimer's Disease Neuroimaging Initiative studies (ADNI, http://adni.loni.usc.edu/). The challenge of modelling such an outcome is that the data are left-skewed with ceiling effects - the maximum possible score on the MMSE is 30 and this maximum is often achieved by healthy individuals. Different approaches have been considered in the statistical literature, such as linear mixed effects models on transformed data, mixture models based on latent class growth analysis and generalized additive models for location, scale and shape (GAMLSS). We apply the binomial and beta-binomial GAMLSS specifications because they allow to account for the features of the data. We use non-parametric random effects to model correlations among repeated measures on the same individual and maximum likelihood for estimation and inference. We propose a bootstrap method for estimation of the covariance matrix of the estimates needed for hypothesis testing involving more than one regression coefficient. Finally, we perform simulation studies to compare the estimation procedure implemented in the gamlss R package under different scenarios.