



Statistics and Actuarial Science Seminar

Title: Interpretable Brain Age Prediction Using Latent Variable Models of Functional Connectivity

Speaker: Sandipan Roy (University of Bath)

Date: Mon 12th April 2021 at 12:00PM

Location: Online

Abstract: Neuroimaging-driven prediction of brain age, defined as the predicted biological age of a subject using only brain imaging data, is an exciting avenue of research. In this work we seek to build models of brain age based on functional connectivity while prioritizing model interpretability and understanding. This way, the models serve to both provide accurate estimates of brain age as well as allow us to investigate changes in functional connectivity which occur during the ageing process. The methods proposed in this work consist of a two-step procedure: first, linear latent variable models, such as PCA and its extensions, are employed to learn reproducible functional connectivity networks present across a cohort of subjects. The activity within each network is subsequently employed as a feature in a linear regression model to predict brain age. The proposed framework is employed on the data from the CamCAN repository and the inferred brain age models are further demonstrated to generalize using data from two open-access repositories: the Human Connectome Project and the ATR Wide-Age-Range.

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