Muhammad Nazmuddin, PhD student

Home lab: Parkinson's Disease research group, Department of Neurology, University Medical Centre Groningen, the Netherlands

Host lab: Methods group, Functional Imaging Lab, Wellcome Centre for Human Neuroimaging, University College London, UK

Exchange period: 1 February-28 April 2022

The aim of my short internship at the Wellcome Centre for Human Neuroimaging London was twofold: to follow lectures and workshops organized in the master program of advanced neuroimaging at the University College London; and to apply data analyses on resting-state functional MRI data using functional and effective connectivity approaches.

In the first objective, several topics of advanced human neuroimaging analyses were taught. These include the introductory lectures on several MRI acquisition methods such as T1, diffusion-weighted, and functional MRI, magnetoencephalography, and electroencephalography. Furthermore, their utilities both for clinical diagnostics and research were discussed. Finally, several hands-on workshop series were given to practically learn analysis techniques that are commonly used in neuroimaging research. This course was held from February until the end of April.

As for the second objective, I joined the neuroimaging method group led by Dr. Peter Zeidman and Prof. Karl Friston who supervised me in analyzing resting-state functional MRI data of Parkinson's disease subjects. In this project, I exploratorily searched for functional connectivity of the cholinergic basal forebrain in PD across different cognitive states: cognitively-normal versus cognitively-impaired PD versus healthy control. I learned preprocessing and functional connectivity analyses of functional MRI data using several publicly available Matlab-compatible toolboxes such as SPM, GIFT, and CONN.

The temporary results of this project were presented as a poster presentation at the International Association of Parkinson's Disease and Related Disorders Conference held in Prague, the Czech Republic on May 1st-4th 2022. The abstract can be looked up here: https://www.iaprd-world-congress.com/inhalt/uploads/2022/04/IAPRD2022-Abstract-E-Book.pdf

I would like to thank the Federation of European Neuroscience Societies for its support through the Network of European Neuroscience Schools (NENS) exchange grant program which enabled me to do this internship. Personally, this program allowed me to develop several sets of analytical skills in neuroimaging research. Additionally, it also enabled me and my research group to expand our scientific and knowledge-exchange network with neuroimaging experts at the Wellcome Center for Human Neuroimaging at the University College London. Finally, the analytical techniques that I learned during this internship will enrich our approaches to analyzing our own neuroimaging data.

Below are several pictures during my internship in London and poster presentation in Prague:

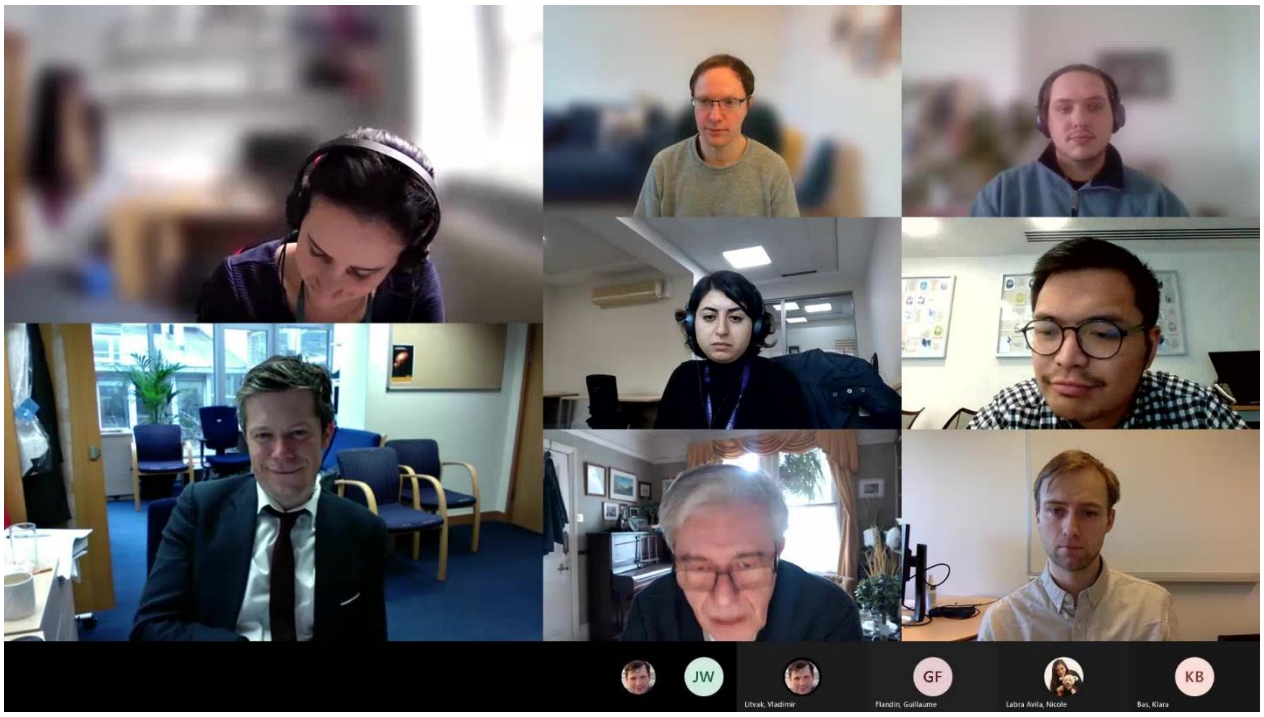

Figure 1. My online project presentation with the Methods Group of the Functional Imaging Lab led by Prof. Karl Friston and Dr. Peter Zeidman

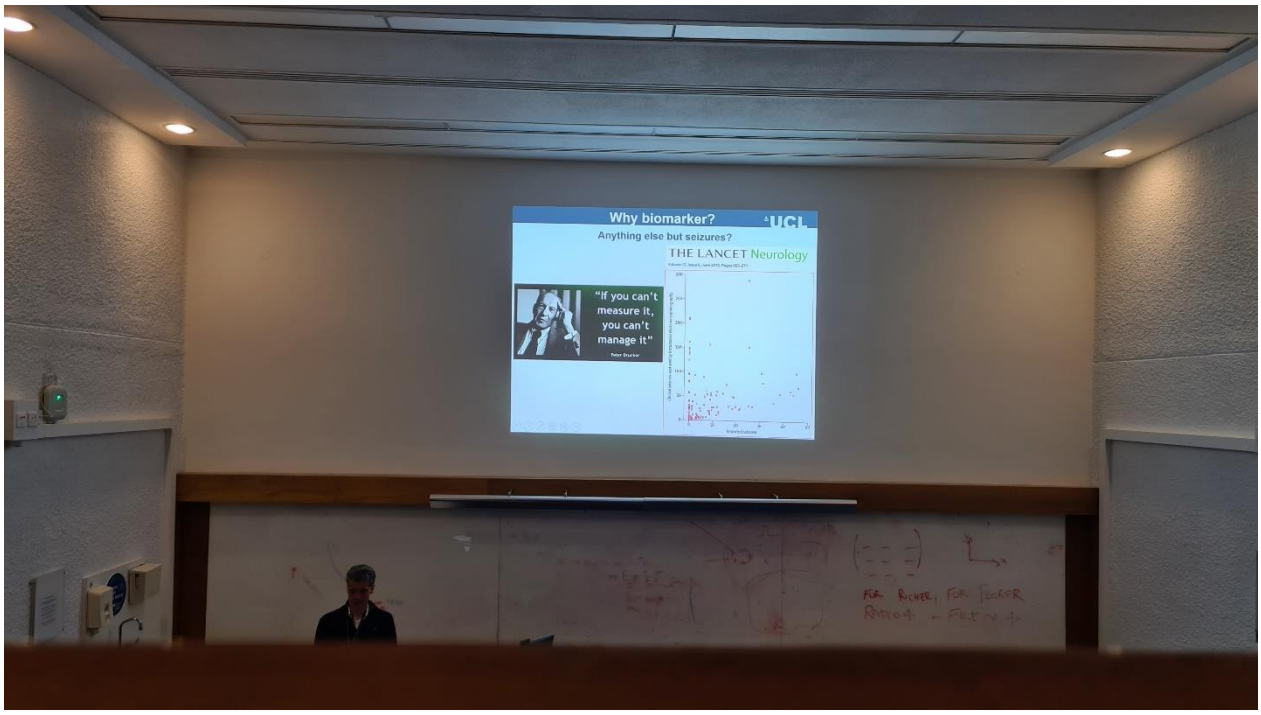

Figure 2. A lecture that I attended which is a part of the master program of advanced neuroimaging, University College London.

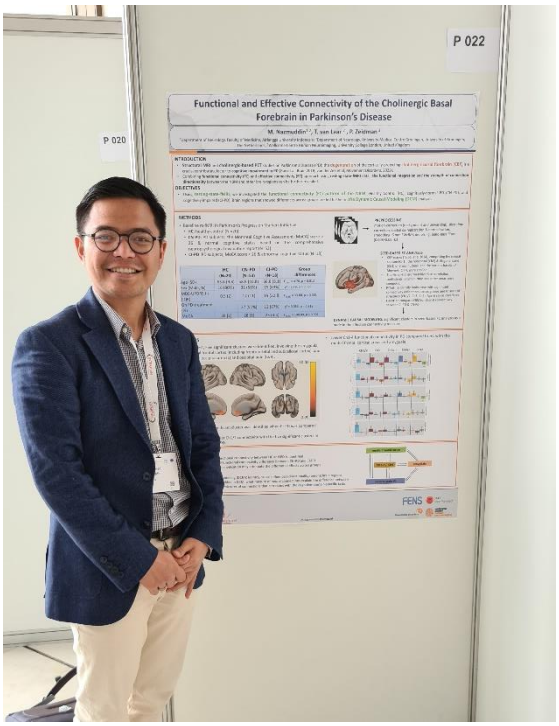

Figure 3. My scientific poster presentation on the research project that I conducted in London at the International Association of Parkinson's Disease and Related Disorders (May 1st-4th 20222) in Prague, Czech Republic.

Figure 4. I and Dr. Peter Zeidman posed at the UCL Queen Square Institute of Neurology and Neurosurgery, London UK.