Thomas Samuel Binns

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EDUCATION

2021 – Present Einstein Center for Neurosciences Berlin, Germany
Ph.D. Neuroscience Fellow
I am currently completing a period of laboratory rotations in the topis of movement disorders, neurotechnology, and computational neuroscience, prior to deciding on a final group with which to complete my fellowship-funded Ph.D.

2016 – 2021 University of Aberdeen, UK
M.Sci. (Hons) Neuroscience with Psychology with Industrial Placement, First-Class Honours
Industrial Placement (Master's) thesis – "Investigating neural precursors of self-initiated action using machine learning techniques". Placement at the Bernstein Center for Computational Neuroscience, Germany. Supervisors: Dr. Matthias Schultze-Kraft and Prof. John-Dylan Haynes. First-Class.
Honours (Bachelor's) thesis – "Investigating the neuromodulation of striatal activity *in silico*". Supervisor: Dr. Antonio Gonzalez. First-Class.

SELECTED WORK EXPERIENCE

01/2022 – Present Clinical Neurotechnology Laboratory, Charité – Universitätsmedizin Berlin, Germany
Role: Researcher Supervisor: Prof. Surjo Soekadar
I am developing a biologically representative, 3D-printed head phantom, for the purpose of developing sophisticated forward models of brain activity in EEG recordings. Through this highly practical project, I am improving my understanding of the technical aspects of electrophysiological research, such as hardware development and material sciences.

07/2021 – 12/2021 Neumann ICN Group, Charité – Universitätsmedizin Berlin, Germany
Role: Researcher Supervisor: Prof. Wolf-Julian Neumann
I studied cortical-subthalamic coherence using ECoG and subthalamic LFP recordings from Parkinson's disease patients, with the goal of identifying biomarkers for use in adaptive deep brain stimulation. Through this work, I developed my signal analysis and Python programming skills, and also gained an in-depth understanding of movement disorders.

08/2019 – 08/2020 Haynes Laboratory, Bernstein Center for Computational Neuroscience, Germany
Role: Researcher Supervisors: Dr. Matthias Schultze-Kraft, Prof. John-Dylan Haynes
The core theme of my work was the investigation of choice-predictive brain signals and movement initiation, funded by an Erasmus+ Traineeship grant. My tasks involved designing and conducting EEG experiments, with extensive analysis of EEG data using MATLAB, Python, and SPSS. I developed an in-depth understanding of EEG-based brain-computer interfaces and machine learning techniques, and furthered my understanding of core concepts such as linear algebra, calculus, signal analysis, and statistics. Additionally, I co-authored a research article that has been published in *eNeuro,* and gained experience as a researcher working in an academic laboratory setting.

SELECTED PUBLICATIONS

Schultze-Kraft, M., Jonany, V., **Binns, T.S.**, Soch, J., Blankertz, B. and Haynes, J.D., 2021. Suppress me if you can: neurofeedback of the readiness potential. *eNeuro, 8*(2). DOI: 10.1523/eneuro.0425-20.2020.

Binns, T.S., 2020. Has neuroscience disproven free will?. *BNA Bulletin*, 1 August, p. 20. Available at www.bna.org.uk.

FUNDING

2021 – 2024 *Ph.D. Fellowship*, €63,000.
Einstein Center for Neurosciences Berlin.

2019 – 2020 *Investigating choice-predictive brain signals using EEG-based brain-computer interfaces*, €5,000.
Erasmus+ Traineeship grant, British Council.

2018 *Free Will and Neural Activity in Consequential Action*, £2,000.
Biomedical Vacation Scholarship, Wellcome Trust.

PROFESSIONAL MEMBERSHIPS

09/2018 – 09/2021 British Neuroscience Association (BNA), Bristol, UK

Role: Member

As a member of the BNA I took full advantage of the Association's activities, attending talks and symposia to broaden my understanding of various neuroscience topics. Furthermore, I contributed an article examining the neuroscientific study of free will to the BNA's Summer 2020 Bulletin, allowing me to demonstrate and further hone my academic writing skills.

RELEVANT SKILLS

Technical

I am highly confident programming in Python and MATLAB, and am familiar with SPSS, Microsoft Office programmes, NEURON, and Git. Additionally, I have much experience conducting EEG and behavioural experiments, and also possess fundamental skills in basic laboratory techniques such as electrophoresis, ELISA, and endonuclease use. Furthermore, I can quickly familiarise myself with new software and learn new techniques to add to my repertoire.

Research

Through my Ph.D. Fellowship, Honours project, industrial placement, and work as a research assistant, I have been involved in all facets of the research process, from literature review, experimental design, and writing ethics proposals, to data collection and analysis, to write up. This has instilled within me the confidence, independence, and critical thinking required to devise and undertake successful, scientifically rigorous research projects.

Communication

My communication skills have been honed through my engagement in presentations and scientific report writing, as well as through extracurricular roles such as Class Representative and House Captain. With this diverse experience, I am able to communicate information effectively to a range of audiences, from scientific experts to laymen.

Teamwork

Proficient teamwork skills have played an essential part of my education, having been involved in a number of successful group projects, including work in professional, academic laboratory settings such as the Einstein Center for Neurosciences Berlin, the Bernstein Center, and the University of Aberdeen's School of Psychology and School of Medicine, Medical Sciences and Nutrition. My engagement in these projects has ensured that I am able to work cohesively with others in both smaller and larger groups.

ACHIEVEMENTS AND INTERESTS

Neuroscience Student Prize

Upon completion of my M.Sci. degree I was honoured to receive the University of Aberdeen's prize for best neuroscience student, a yearly prize presented to a student on the Neuroscience degree programme in recognition of the individual's excellent performance during their time at the university.

Sports

I am an avid athlete, being a member of the Berlin Rock Climbing and Bouldering club, as well as having previously been a member of the University of Aberdeen Athletics Society and having represented my school in the Lewisham Cross-Country Championship. Through my strong discipline and self-motivation I am able to adhere to a rigorous exercise regime, testament to both my dedication and well-rounded character.

Music

I have played the drum kit for fifteen years, achieving a Distinction at Grade 8. Whilst studying at Aberdeen I was the drummer for the University's Jazz Band, playing at numerous concerts, including yearly performances at the Aberdeen Jazz Festival and the University of Aberdeen's Concert Series. I have also been involved in Lewisham Music Service's African Drumming Group and Samba Band and have taken up the piano, achieving a Distinction at Grade 1. My participation in these activities has enhanced both my communication and teamwork skills greatly, and again attests to my well-rounded character and the fact that I remain dedicated to all routes I pursue.

References Available Upon Request