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tsbinns.com/CV

Thomas Samuel Binns

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EDUCATION

2021 – Present **Einstein Center for Neurosciences Berlin, Germany**
Ph.D. Neuroscience Fellow
For the project of my fellowship-funded Ph.D., I am investigating connectivity between the cortex and subthalamic nucleus of the basal ganglia as a biomarker of Parkinson's disease for use in next-generation adaptive deep brain stimulation, supervised by Prof. Wolf-Julian Neumann and Dr. Stefan Haufe of the Charité – Universitätsmedizin Berlin.

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

07/2021 – Present **Neumann ICN Group, Charité – Universitätsmedizin Berlin, Germany**
Role: Researcher **Supervisors: Prof. Wolf-Julian Neumann, Dr. Stefan Haufe**
I am studying cortical-subthalamic connectivity using invasive recordings from Parkinson's disease patients, with the goal of identifying biomarkers for use in adaptive deep brain stimulation. Through this work, I am developing my signal analysis and Python programming skills, as well as gaining an in-depth understanding of movement disorders.

01/2022 – 03/2022 **Clinical Neurotechnology Group, Charité – Universitätsmedizin Berlin, Germany**
Role: Researcher **Supervisor: Prof. Surjo Soekadar**
I began work for the development of a 3D-printed head phantom for improving our understanding of forward models of brain activity, and the effects of non-invasive stimulation on brain activity. Through this highly practical project, I improved my understanding of the technical aspects of electrophysiological research, 3D printing, and electrical engineering.

08/2019 – 08/2020 **Haynes Group, Bernstein Center for Computational Neuroscience, Germany**
Role: Researcher **Supervisors: Dr. Matthias Schultze-Kraft, Prof. John-Dylan Haynes**
I investigated 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 brain-computer interfaces and machine learning techniques. Additionally, I co-authored a research article published in *eNeuro*.

SELECTED PUBLICATIONS

Binns, T.S., Merk, T., Köhler, R., Chikermane, M., Dzaye, A., Vanhoecke, J., Faust, K., Schneider, G.-H., Kühn, A.A., Neumann, W.-J., 2022. Invasive mapping of cortico-subthalamic connectivity in Parkinson's disease. *2nd Expert Summit on the Future of Deep Brain Stimulation*, Würzburg, Germany. 🔗

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**.

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, Bristol, UK
Role: Member
As a member of the British Neuroscience Association I took full advantage of the organisation'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 Association'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 researcher, I have been involved in all facets of the research process, from literature review, experimental design, and writing ethics proposals, to data collection, analysis, and write-up. This has instilled within me the confidence, independence, and critical thinking required to devise and undertake successful, scientifically rigorous research.

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. This has included work in professional and academic settings, such as at the Charité and Bernstein Center, as well as in extracurricular roles like the Youth Philanthropy Initiative. 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 this active regime, testament to both my dedication and well-rounded character.

Music
I have played the drum kit for sixteen years, achieving a Distinction at Grade 8 in 2016. Currently I am a drummer for the Berlin Pipe Company, for which I have regular performances, and whilst studying at Aberdeen I was the drummer for the University's Jazz Band where I played at numerous concerts, including yearly performances at the Aberdeen Jazz Festival. I was also involved in the African Drumming Group and Samba Band of my borough's music centre in London. My participation in these activities has enhanced my communication and teamwork skills greatly, and again attests to my well-rounded character and dedication.

References Available Upon Request