Thomas Samuel Binns

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EDUCATION

09/2016 – 06/2021 University of Aberdeen, UK
MSci (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, Berlin. 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.

RELEVANT WORK EXPERIENCE

12/2020 – 04/2021 School of Medicine, Medical Sciences and Nutrition, University of Aberdeen, UK
Researcher Supervisor: Dr. Antonio Gonzalez
As part of my Honour's project, I investigated the regulation of striatal activity through computational modelling. My tasks involved conducting literature reviews, collecting and analysing simulated electrophysiological data using Python and NEURON, as well as writing scientific reports as part of my thesis. Through this placement I developed an in-depth understanding of the simulation and analysis of electrophysiological data, and I gained experience as a researcher working in an academic laboratory setting working cohesively with fellow researchers.

08/2019 – 08/2020 Haynes Laboratory, Bernstein Center for Computational Neuroscience, Berlin, Germany
Researcher Supervisors: Dr. Matthias Schultze-Kraft, Prof. John-Dylan Haynes
My placement at the Bernstein Center was funded by an Erasmus+ Traineeship grant, with the core theme of my work being the investigation of choice-predictive brain signals and the study of movement initiation. My tasks involved designing and conducting EEG experiments, with extensive analysis of EEG data using MATLAB, Python, and SPSS. As part of this work, I co-authored a research article that has been accepted for publication in *eNeuro.* Through this placement 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 gained experience as a researcher working in an academic laboratory setting.

05/2018 – 10/2018 Consciousness, Attention and Perception Laboratory, University of Aberdeen, UK
Research Assistant Supervisor: Dr. Rama Chakravarthi
My work focused on the investigation of choice-predictive brain signals and movement initiation in the context of consequential decisions, and was funded by a Wellcome Trust scholarship. My tasks included conducting EEG and behavioural experiments, as well as EEG and behavioural data analysis using MATLAB and SPSS. This provided me with a solid grounding in the scientific method, and experience as a researcher working in an academic laboratory setting.

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.org/10.1523/eneuro.0425-20.2020

Binns, T.S., 2020. Has neuroscience disproven free will?. *BNA Bulletin*, 1 August, p. 20.

FUNDING

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 – Present British Neuroscience Association (BNA), Bristol, UK

Member

As a member of the BNA I have taken full advantage of the Association's activities, attending talks and symposia to broaden my understanding of various neuroscience topics. Furthermore, I have recently 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 MATLAB and Python, and am familiar with SPSS, Microsoft Office programs, 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 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 Bernstein Center and 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 MSci 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 and member of the University of Aberdeen Athletics Society, and in the past have 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, alongside which I am currently training for a half marathon. This is testament to both my dedication and well-rounded character.

Music

I have played the drum kit for fourteen years, achieving a Distinction at Grade 8. Since entering university I have been the drummer for the University of Aberdeen's Jazz Band, playing at numerous concerts, including yearly performances at the Aberdeen Jazz Festival and the University of Aberdeen's Concert Series. Previously, I have been involved in Lewisham Music Service's African Drumming Group and Samba Band. I have also 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.