

Department of Computer Science

Dr John Cartlidge BSc PhD
Refinitiv Associate Professor in
Financial Informatics and Data Science

2.48 Merchant Venturers Building,
Woodland Road, Bristol, BS8 1UB
Email: john.cartlidge@bristol.ac.uk

RE: PhD Application, Mr Bingde LIU

12th Aug 2022

Dear Sir/Madam,

I am Dr Cartlidge, Refinitiv Associate Professor in Financial Informatics and Data Science, in the Department of Computer Science at the University of Bristol. I am also Programme Director of the MSc Financial Technology with Data Science. I am writing to recommend Mr Bingde Liu as a candidate for a PhD programme in your department. Bingde is due to complete his MSc in Financial Technology with Data Science at University of Bristol in September 2022. Bingde is a very strong student on the programme, and I am confident that he will achieve a distinction grade.

Bingde has performed at a consistently high level during his year of study at Bristol and he has shown a talent for independent research. Bingde first came to my attention when we marked his technical paper on reinforcement learning in automated trading agents. His work was at an exceptionally high standard, demonstrating excellent understanding and ability, and a flair for research. A modified version of this paper is now available as an eprint on arXiv in advance of submission to an international conference. Currently, I am supervising Bingde's individual dissertation project, where he is exploring deep reinforcement learning for portfolio optimisation.

Bingde is highly motivated, independent, and has excellent communication skills in English. His potential for a strong academic career is clear and I have no doubt that he will flourish as a PhD candidate under your supervision. Bingde's current research interests are in the areas of reinforcement learning, online learning, and financial market analysis. He has demonstrated excellent capability in these areas, but I am confident that he will also be successful if he focused his attention on other research areas.

Yours faithfully,



John Cartlidge

Refinitiv Associate Professor in Financial Informatics & Data Science
Programme Director MSc Financial Technology with Data Science