UNIVERSITY OF CAMBRIDGE

F520 Behavioural Finance
Syllabus

Instructor: Prof Peter Bossaerts
When: Lent, Weeks 1-9, Tu. 4-6pm

What is this class about?

The goal is to better understand human attitudes towards uncertainty in general, and financial risk in particular. The method to get there is to go beyond a pure behaviouralist approach (the tradition of economics), point to the difficulty of deciphering the psychology behind behaviour (the "thinking"/cognition and "feeling"/affect), to eventually land squarely in the domain of neurobiology. After all, humans are biological computers, and they must act accordingly, so why not start there? The approach promises more comprehensive insights than from a purely behavioural study (which makes humans look like a bug-plagued organism), and it bypasses difficult issues of awareness and consciousness (what if people don't know what they think or feel?). Among others, the results are: novel insights into the role of emotions; an appreciation that neurobiology provides foundations for machine learning (and how the newest in computational neuroscience may yet revolutionise machine learning); a deeper understanding as to whether and how "smart drugs" (popular among students and professionals) work.

What is the format?

Two-hour weekly lectures; online individual games; one online interactive game involving trading in financial markets

Materials

Slides used in the lectures will be made available, as well as a list of required readings and background readings.

Examination and Grading

Through a project. Details to be announced.

Topics (Per Week; exemplary reading below each topic)

1. What is "Behavioural finance?" Why (also) "Neuro-finance?"

   Frydman, C., Barberis, N., Camerer, C., Bossaerts, P. and Rangel, A., 2014. Using neural data to test a theory of investor behavior: An application to realization utility. *The Journal of finance*, *69*(2), pp.907-946.

2. Neurobiology: A Primer

Riedl, R. and Léger, P.M., 2016. A primer on neurobiology and the brain for information systems scholars. In *Fundamentals of NeuroIS* (pp. 25-45). Springer, Berlin, Heidelberg.

3. An Example: Human Attitudes Towards Tail Risk

Kandasamy, N., e.a., 2016. Interoceptive ability predicts survival on a London trading floor. *Scientific reports*, *6*(1), pp.1-7.

4. How the Brain Perceives and Chooses: Predictive Coding

Clark, A., 2013. Whatever next? Predictive brains, situated agents, and the future of cognitive science. *Behavioral and brain sciences*, *36*(3), pp.181-204.

5. From Predictive Coding to Machine Learning

Subramanian, A., Chitlangia, S. and Baths, V., 2022. Reinforcement learning and its connections with neuroscience and psychology. *Neural Networks*, *145*, pp.271-287.

6. The Role of Emotions

Barrett, L.F. and Satpute, A.B., 2019. Historical pitfalls and new directions in the neuroscience of emotion. *Neuroscience letters*, *693*, pp.9-18.

7. From Optimal Control to Control of Surprise

Sajid, N., Ball, P.J., Parr, T. and Friston, K.J., 2021. Active inference: demystified and compared. *Neural computation*, *33*(3), pp.674-712.

8. Complexity

Franco, J.P., e.a., 2021. Generic properties of a computational task predict human effort and performance. *Journal of Mathematical Psychology*, *104*, p.102592.

9. Social Interaction Through Financial Markets

De Martino, B., e.a., 2013. In the mind of the market: Theory of mind biases value computation during financial bubbles. *Neuron*, *79*(6), pp.1222-1231.

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