PS941-15 Computational Behavioural and Social Science

24/25

Department
Psychology
Level
Taught Postgraduate Level
Module leader
Lukasz Walasek
Credit value
15
Module duration
9 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

In an era of widespread digitization of data and the continuous evolution of novel computational techniques, new and exciting opportunities emerge for studying human behaviour. This module introduces students to the topic of applied behavioural data science, equipping them with skills and knowledge for gaining new insights into people's behaviour in real-world social contexts. This module is specifically tailored for the students on the MSc in "Behavioural and Economic Science" and "Behavioural Data Science" who are interested in combining their understanding of advanced quantitative methods with the theoretical ideas about human behaviour.

Module aims

This module will introduce students to computational approaches in behavioural and social sciences. The module will equip students with a good understanding of current computational techniques both for data analysis and social simulation. This module will also show how these techniques can be applied to study behaviour of individuals and groups, going beyond the context of laboratory studies.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Introduction to Behavioural Data Science
Data Mining and Scraping
Supervised Machine Learning
Unsupervised Machine Learning
NLP: Introduction to Text Analysis
NLP: Large Language Models
Social Simulation Approaches
Agent Based Modeling
Network Analysis I
Network Analysis II

Learning outcomes

By the end of the module, students should be able to:

- Describe existing applications of computational models for studying human behaviour.
- Understand how to generate and answer new questions about people's attitudes, beliefs, and preferences by using methodologies from computational behavioural and social science.
- Develop new analytical approaches for uncovering new insights about human behaviour with computational methods.
- Implement advanced computational methodologies to extract, process, and analyse human data.
- Design and explore simulations of human social networks.

Indicative reading list

Dehghani, M., & Boyd, R. L. (Eds.). (2022). Handbook of language analysis in psychology. The Guilford Press.
Hills, T. (2024). Network Analysis. Cambridge University Press.
Fowler, J. H., & Christakis, N., (2011). Connected: The surprising power of our social networks and how they shape our lives. Little, Brown Spark.
Jackson, Joshua Conrad, David Rand, Kevin Lewis, Michael I. Norton, and Kurt Gray. "Agent-based Modeling: A Guide for Social Psychologists." Social Psychological & Personality Science 8, no. 4 (May 2017): 387–395.

Interdisciplinary

The module concerns applications of advanced computational methods in the context of behavioural and social science research. The computational methods are primarily developed and used in statistics and computer sciences. The areas of application encompass psychological and economic aspects of human behaviour. Some broader applications of the social models will involve topics that touch on areas of political science (e.g., polarization) and public health.

Subject specific skills

At the end of the module, the student will be able to:

- Design research in the areas of computational behavioural and social science.
- Analyse large volumes of human generated data using supervised and unsupervised methods.
- Create scraping methods for harvesting online data.
- Conduct computational analysis of textual data
- Simulate social processes and analyse social networks

Transferable skills

Critical evaluation of the academic literature
Ability to design and conduct research projects
General programming and data analysis skills

Study

Study time

Type	Required
Lectures	9 sessions of 2 hours (12%)
Practical classes	5 sessions of 2 hours (7%)
Private study	122 hours (81%)
Total	150 hours

Private study description

122 hours private guided study, including completion of assessments and work on the activities introduced during the practical sessions.

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A

	Weighting	Study time
Class Test 1	10%	

	Weighting	Study time

Combination of multiple choice and short answers. Covers content of first half of the module.

Class Test 2 10%

Combination of multiple choice and short answers. Covers content of second half of the module.

Practical report 1 40%

A set of proposed solutions to research questions that include a written component and programming code. The report will consist of multiple questions, presenting students with mini-research challenges.

Practical report 2 40%

A set of proposed solutions to research questions that include a written component and programming code. The report will consist of multiple questions, presenting students with mini-research challenges.

Feedback on assessment

No feedback for the class test.
Written feedback for the practical reports.

Availability

Courses

This module is Optional for:

- Year 1 of TPSS-C803 Postgraduate Taught Behavioural and Data Science
- Year 1 of TPSS-C8P7 Postgraduate Taught Behavioural and Economic Science (Science Track)
- Year 1 of TECS-C8P8 Postgraduate Taught Behavioural and Economics Science (Economics Track)
- Year 1 of TPSS-C8P9 Postgraduate Taught Psychological Research