

SO365-15 Social Data Science

20/21

Department

Sociology

Level

Undergraduate Level 3

Module leader

Ulf Liebe

Credit value

15

Module duration

10 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

What is so exciting about big data, data science and R? How can data science help towards a better understanding of social, political and economic processes? What does machine learning have to do with explaining societal outcomes, human behaviour and language usage? This module will develop students' understanding of social data science, corresponding ethical issues as well as why data science is a useful tool for research conducted at universities, governmental and non-governmental organisations, as well as private companies in various sectors. Besides discussing applications of social data science to the study of sociological, political, economic, criminal and language phenomena, the module will provide students with the skills to conduct and critically reflect on social data science research. The module does not require prior knowledge of R and advanced statistical techniques. It will provide an introduction to R and include some basic applications of social data science, for example in the context of web data collection and analysis, as well as quantitative text analysis.

Module aims

This module will develop students' understanding of social data science, corresponding ethical issues as well as why data science is a useful tool for research conducted at universities, governmental and non-governmental organisations, as well as private companies in various sectors. Besides discussing applications of social data science to the study of sociological,

political, economic, criminal and language phenomena, the module will provide students with the skills to conduct and critically reflect on social data science research.

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.

Week 1: Understanding the Excitement: What is Social Data Science?

- This session will introduce social data science and refer to various applications across social science disciplines and the humanities.

Week 2: Exploring Novel Insights: What Does Social Data Science Tell Us About Societies?

- This session will provide a more in-depth discussion of selected applications of social data science as well as related ethical problems.

Week 3: Learning a Language of Data Science: Why Do Many People Talk about R, and How Does It Work?

- This session will provide an introduction to R. Also, access to (big) open data as well as limitations in data access of companies will be discussed.

Week 4: Harvesting Big Data: How Can We Collect Data from the Web? (I)

- Students will discuss applications of web data collection and analysis in the social sciences and humanities. They will apply the method to data such as Wikipedia pages.

Week 5: Harvesting Big Data: How Can We Collect Data from the Web? (II)

- Students will continue to apply the method to data such as (social) media content.

Week 6: Reading Week

Week 7: Predicting Social Outcomes: How Does Supervised Machine Learning Work? (I)

- Students will discuss applications of supervised machine learning in the social sciences and humanities. They will apply the method, for example to quantitative text data.

Week 8: Predicting Social Outcomes: How Does Supervised Machine Learning Work? (II)

- Students will continue to apply supervised machine learning.

Week 9: Discovering Social Structures: How Does Unsupervised Machine Learning Work? (I)

- Students will discuss applications of unsupervised machine learning in the social sciences and humanities. They will apply the method, for example to quantitative text data.

Week 10: Discovering Social Structures: How Does Unsupervised Machine Learning Work? (II)

- Students will continue to apply unsupervised machine learning.

Illustrative Bibliography

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Hofman, J.M., A. Sharma and D.J. Watts, 2017. Prediction and explanation in social systems. *Science*, 355, pp. 486-488.

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- McClendon, L. and N. Meghanathan, 2015. Using Machine Learning Algorithms to Analyse Crime Data. *Machine Learning and Applications: An International Journal (MLAIJ)*, 2(1), 1-12.
- McFarland D.A., D. Ramage, J. Chuang, J. Heer, C.D. Manning, and D. Jurafsky, 2013. Differentiating language usage through topic models. *Poetics*, 41, pp. 607-625.
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- Pearl, J. and D. Mackenzie, 2018. *The book of why: The new science of cause and effect*. New York: Basic Books.
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- Sloan, L. and A. Quan-Haase, 2017. *Sage Handbook of Social Media Research Methods*. London: Sage.
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- Williams, M.L., P. Burnap, H. Liu, A. Javed and A. Ozalp, 2020. Hate in the machine: Anti-black and anti-Muslim social media posts as predictors of offline racially and religiously aggravated crime. *British Journal of Criminology*, 60(1), pp. 93-117.

Learning outcomes

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

- To familiarise students with foundations and applications of social data science
- To raise students' awareness of the potential and pitfalls of social data science
- To equip students with the skills to understand and undertake social data science research

Research element

Some data analysis required in teaching

Interdisciplinary

Interdisciplinary module for students in the social sciences and humanities

Opportunities for interdisciplinary learning are communicated to students

Subject specific skills

Systematic understanding, coherent and detailed knowledge of key concepts and approaches of social data science

Ability to describe and comment on the advantages and pitfalls of different data science approaches

Ability to conduct social data science research

Transferable skills

By developing and conducting their own data analysis ...
the exercise of initiative and personal responsibility,
decision-making in complex and unpredictable contexts when working with new data.

Study

Study time

Type	Required
Lectures	9 sessions of 1 hour (6%)
Seminars	9 sessions of 2 hours (12%)
Private study	123 hours (82%)
Total	150 hours

Private study description

Reading for seminars; preparation for seminars; preparation for data analyses; preparation and writing of formative work; preparation and writing of summative work

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group A

	Weighting	Study time
Assessed essay	100%	
Individual 3000 words essay		

Feedback on assessment

Regular informal feedback will be provided throughout the module seminar sessions.

Formative: Feedback will be provided on the formative essay.

Summative: Written feedback will be provided on the summative essay.

Availability

Courses

This module is Core optional for:

- Year 3 of ULAA-ML33 Undergraduate Law and Sociology

This module is Optional for:

- USOA-L301 BA in Sociology
 - Year 3 of L301 Sociology
 - Year 3 of L301 Sociology
 - Year 3 of L301 Sociology
- Year 4 of USOA-L306 BA in Sociology (with Intercalated Year)
- Year 3 of USOA-L314 Undergraduate Sociology and Criminology

This module is Option list A for:

- ULAA-ML34 BA in Law and Sociology (Qualifying Degree)
 - Year 3 of ML34 Law and Sociology (Qualifying Degree)
 - Year 4 of ML34 Law and Sociology (Qualifying Degree)
- Year 4 of ULAA-ML33 Undergraduate Law and Sociology

This module is Option list B for:

- Year 3 of UPOA-ML13 Undergraduate Politics and Sociology
- Year 4 of UPOA-ML14 Undergraduate Politics and Sociology (with Intercalated year)