AALBORG UNIVERSITET

Social Analytics in Context (Fall 2017)

Module description

Project module on the 9th semester (10 ECTS, taught in English)

Module coordinators: Toine Bogers and Carina Ren

Curricula

The Information Studies degree is placed under the Study Board of Communication and Digital Media.

Link to overall curriculum

http://www.fak.hum.aau.dk/digitalAssets/288/288826_ka_information-studies_2017_hum_aau.dk.pdf

Kommentar [1]: Updated to 2017 version...

Content

The module social analytics in context comprises preparation of a project concerning digital collaboration and contains data preparation and data analytics. The project must be carried out in collaboration with an organization or community.

Objectives

In this module students will acquire

Knowledge of:

- Dataset construction and data harvest, including its technical, ethical and legal implications
- Data relevant problems in organizations, including their relation to organizational culture and the wider ecology of methods available in the organization
- Data driven research designs and their implications for data needs and analysis.

Skills in:

- Formulating data-driven questions that make sense in context, taking available data, existing knowledge practices and the strategic situation of the organization into account.
- Carrying out relevant data analysis
- Producing relevant data visualizations
- Narrating methods and findings in ways that make sense to the organization.

Competences in:

- The management of a data project, including its different stages, components and participants
- The translation of data projects into real world cases and contexts

Module activities

The Social Analytics in Context (SAiC)project module does not contain any actual lectures or labs. Instead, it features a handful of seminars together with Wonderful Copenhagen, this year's corporate client who will provide social data and current problems they would like to have solved using this data. At the end of the course, the last seminar takes the form of a shark-tank session, where all student groups present their work and compete for the Best Semester Project honors.

The project module has no required reading; all required reading is part of the four 5-ECTS study modules instead.

Examination

An internal oral examination in **"**Social Analytics in Context**".** The examination is a conversation between the student(s) and the examiner based on a project report produced individually or in a group. The project report/written work will be considered the shared responsibility of the group. Students will be examined and assessed on the basis of the entire project report, and one combined grade will be awarded each student for the project report and the oral performance.

Literature foundation: 1000 standard pages supervisor approved, self-selected literature related to the project.

The project report: the total number of pages must be no less than 10 pages and no more than 15 pages per student in a project group, and 20 pages if written individually.

Duration of examination: 15 minutes per student and 5 minutes per group for assessment and announcement of result. 20 minutes in total for individual examinations. At oral group examinations, the examination must be conducted in such a way that individual assessment of each individual student's performance is ensured.

Evaluation: Grading according to the 7-point scale. The project report and the conversation must demonstrate that the student fulfils the objectives for the module stated above. In the evaluation of the examination performance, the grade 12 will only be awarded to students who give an excellent performance and demonstrate that they have fulfilled the above objectives exhaustively or with only few insignificant omissions. Any re-examinations will be held on the basis of a revised project report.

AALBORG UNIVERSITET

Digital Collaborations (Fall 2017)

Module description

The course offers an overview of digital sociality and governance, presenting issue such as Smart Cities and Big Data in a larger societal context. During the course, students are provided with an understanding of how digital collaboration may be instigated and to what purpose. Drawing on collaboration with external partners, students will learn about the opportunities and challenges with data-driven, collaborative projects in various social and organizational contexts.

Module title + ECTS

Digital Collaborations (*Digitale Samarbejder*)
5 ECTS

Placement

9th semester
Study Board of Communication and Digital Media

Module coordinator

Carina Ren

Type & language

Study module
English

Objectives

In this module students will acquire:
Knowledge of:

- The current landscape of digital collaboration in and between various public and private organizations.
- Theoretical approaches to digital, data-driven knowledge collaboration
- The values and opportunities of data-driven collaboration projects as well as their challenges for various stakeholders

Skills in:

- Identifying areas where data-driven collaboration projects can add to existing value propositions
- Crafting digital collaborative set-ups
- Critically discussing and reflecting on digital collaborations and their outcomes for various types of stakeholders

Competencies in:

- Designing and discussing collaborative strategies in the context of relevant data project topics

- Professionally engaging in, assessing and reflecting on data-driven knowledge collaborations
- Independently continuing one's individual competency development within digital collaborations

1. Introduction: content, expectations, requirements
During this introductory session, the content and rational of the course is explained and we discuss the expectations from students and teachers. Through a number of examples, we explore the potentials and challenges of digital collaboration sin creating value in business and society. Lastly, this years' digital partner, Wonderful Copenhagen, is introduced and we tentatively kick around ideas for possible projects.

Readings:
WoCos stategy: "*The end of tourism*", (2017) http://localhood.wonderfulcopenhagen.dk/

Ren & Jóhannesson (2018) Collaborative Becoming. Exploring tourism knowledge collectives. In Ren, C. G.T. Jóhannesson & R. van der Duim (2018) Co-creating Tourism research. Collaborative ways of knowing. Oxon: Routledge (in press)

Lev Manovich (2016) Trending. The promises and challenges of Big Social data. In Gold, M. ed. *Debates in the Digital Humanities*. Minnesota University Press

2. Deconstructing digital concepts: Big data & smart cities
In our second session, we continue our focus from the previous session on our own experiences with digital collaborations. We will begin to explore two main course concepts and their context, namely 'big data' and 'smart cities'. Both concepts, and big data in particular, have been heralded as revolutionary forces in research and society, while others critically argue they merely represent business as usual. So how do we find our way between the big revolution and business as usual?

Readings:
Driscoll, Kevin (2012) "From Punched Cards to "Big Data": A Social History of Database Populism," communication +1: Vol. 1, Article 4.

Cukier, K. & Mayer-Schonberger, V. (2013) *Big data – A revolution that will transform how we live, think and work*, John Murray Publishers, United Kingdom. (chapters 'NOW' and 'DATAFICATION'). 43 ns.

Hollands, R. (2008) Will the real smart city please stand up? *City 12*(3),2008

Links:
The Milestone Project historical overview of data visualisations

Supplementary readings:
Science (20016) Predictions Special
Issues **http://science.sciencemag.org.zorac.aub.aau.dk/content/355/6324**

3. Digital reflexivity and critical thinking
In this third session, we explore and discuss possible critical and reflexive approaches to digital sociality, namely Science and Technology Studies and Critical Theory.
First assignment given 'Digital reflections' (2-3 pages) – deadline 13. September

Readings:
Ruppert, E., Law, J., & Savage, M. (2013). Reassembling social science methods: The challenge of digital devices. *Theory, culture & society 30*(4), 22-46.

Carpentier, N. (2011). Media and participation: A site of ideological-democratic struggle (p. 408). Intellect Ltd.

José van Dike (2013) *The culture of Connectivity*.

4. Understanding/doing the medium: Instagram
In session four, we turn our attention to the medium of Instagram. We explore how Instagram is enacted by its users as well as a multitude of ways to analyze Instagram users and their textual, visual and relational production. You will also get feedback on your first assignment and receive your second assignment.
Second assignment, "Investigating Instagram", given. 2-3 pages. Deadline 26. September

Readings:
Munk, A., Simonsen Abildgaard, M., Birkbak, A. and Krogh Petersen, M.:(2016) (Re-)Appropriating Instagram for Social Research: Three Methods for Studying Obesogenic Environments. *SMSociety '16 Proceedings of the 7th 2016 International Conference on Social Media & Society*. Article No. 1

Tifentale and Manovich (2015) "Selfiecity: Exploring Photography and Self-Fashioning in Social Media" in Berry, David M. and Michael Dieter (eds.) *Postdigital Aesthetics: Art, Computation and Design* (Palgrave Macmillan: 2015), pp. 109-122.

Links:
Selfie City project

5. Participation, communities and their digital formats
We begin tinkering with the concepts “hybrid communities” and “participatory design”. We will be talking about participatory design in a digital setting, and the relationship between a community and its technical format. Our special guest, Andreas Birkbak from the Techno-Anthropology research group, will give a lecture on Marres' text on net-work as format-work and initiate a discussion of whether a network is always just a network
You will get feedback on your second assignment.
Activity: Participatory reading generation! Send us your suggestions for the open session 7. What should we delve deeper into, or what have we missed? Remember also to provide a reason for your suggestion.

Readings:
Callon, M. (2004). The role of hybrid communities and socio-technical arrangements in the participatory design. *Journal of the center for information studies 5*(3), 3-10.

Marres, N. (2006). Net-Work Is Format Work: Issue Networks and the Sites of Civil Society Politics in Jodi Dean, John Asherson, Geert Lovink (eds.) *Networked Communications and Global Civil Society*, Routledge.

Supplementary readings:
Venturini, T., Munk, A. and Jacomy, M. (2016). Actor-Network VS Network Analysis VS Digital Networks Are We Talking About the Same Networks? in Digital STS: A Handbook and Fieldguide.

6. What are good collaborations?
Third assignment given (good collaborations, 2-3 pages) – deadline 15. October.
Activity: Collaborative workshop on next meeting, what do we need to learn at this point? Students choose and prepare sections in groups.
Special guest: Research assistant Louise Klitgaard Torntoft on the research project on open data, www.Open4Citizens.eu.

Readings:
Flyvbjerg, B. (2001). *Making social science matter: Why social inquiry fails and how it can succeed again.* Cambridge university press.

Law, J. (2004). *Matter-ing: Or How Might STS Contribute?*'. Centre for Science Studies, Lancaster University, draft available at http://www.heterogeneities.net/publications/Law2009TheGreer-BushTest, pdf, accessed on December 5th, 2010, 1-11.

Re-read Ren & Jóhannesson (2018) Collaborative becoming.

7. Open session/workshop
Based on texts and discussions generated from the last sessions, we work together and in groups around emerging topics and issues related to the course and the semester projects.

8. Wrap up
This last session, we expand the insight of the course to ...
Finally, we go through and discuss the course and learning outcomes and teachers will answer questions concerning the final portfolio exam.
Activity: Final assignment given – deadline for full portfolio 3. November
Readings:
Jasanoff. (2015) "Future Imperfect: Science, Technology and the Imaginations of Modernity". In Jasanoff and Sang-Hyun (eds.) *Dreamscapes of Modernity. Sociotechnical Imaginaries and the Fabrication of Power*. University of Chicago Press.

Bruun Jensen: Future generating devices

Relation to other modules/semesters

Scope & expectations
20 teaching hours

Exam form
An internal written examination in English in “Digital Collaboration”. The examination is a portfolio submitted in steps during the term, comprising contributions from the students set by the examiner on the basis of the course module. The examination portfolio will be prepared individually by the student and must not exceed 10 pages. The examination portfolio will be evaluated by an internal examiner. A second internal examiner will be included in case of an assignment is given a failed assessment. Evaluation: Grading according to the 7-point scale. The study elements on which the examination is based is equivalent to 5 ECTS. The examination must demonstrate that the student can fulfil the objectives outlined above regarding knowledge and understanding, skills and competencies.

AALBORG UNIVERSITET

Data Analysis & Visualization (Fall 2017)

Module description

Study module on the 9th semester (5 ECTS, taught in English)

Module coordinators: Birger Larsen

Curricula

The Information Studies degree is placed under the Study Board of Communication and Digital Media.

Link to overall curriculum:

http://www.fak.hum.aau.dk/digitalAssets/288/288826_ka_information-studies_2017_hum_aau.dk.pdf

Kommentar [1]: Updated to 2017 version...

Content

DAV provides students with an understanding of different analytical strategies and their implications for data modelling, including descriptive and predictive approaches. It also provides hands-on experience with different data visualization techniques and their analytical contributions.

Objectives

In this module students will acquire

Knowledge of:

- Descriptive analytics, such as social network analysis and dimensionality reduction
- Predictive analytics, such as regression and machine learning
- Techniques for data visualization

Skills in:

- Conducting data-driven analysis
- Conducting participatory data design with users
- Identifying, comparing, and selecting relevant techniques for describing and analyzing data about user behavior, interaction, and/or opinions
- Selecting the optimal data visualization techniques for describing and analyzing digital trace data

Competences in:

- Applying analytical tools to real-world cases
- Taking an analytical, reflective and critical approach to the analysis, visualization, and interpretation of collected research data

Module activities

1. Intro to data analytics

This lecture give a broad inroduction to data analytics a visualisation - with focus on predictive aspects. The goal of the early scheduling of the lecture is to emphasise predictive aspects so that they can be in back of the mind during the Data Preparation and Understanding class.

Required reading

- Foster, I., Ghani, R., Jarmin, R. S., Kreuter, F., & Lane, J. (2017). Chapter 6: Machine Learning. In Big Data and Social Science: A Practical Guide to Methods and Tools (pp. 147-186). Boca Raton, FL: CRC Press Taylor & Francis Group. [40 pages / This chapter gives a good general introduction to machine learning and the principles behind some of the most popular algorithms and as such we recommend you read this first.]

2. Predictive analytics (part 1)

Predictive analytics encompasses a range of methods, techniques and algorithms from the fields of machine learning, data mining, and statistics that can be used to detect meaningful patterns in large data sets and associate them with expected outcomes. For example, we could teach the computer to predict the amount of money tourists will spend in a city, depending on the sights and attractions they visit or we could classify tourists into different tourism archetypes depending on their behavior.

In the first lecture on this topic, we will focus on the problem of predicting continuous values given a data set containing different variables that describe our problem. In particular, we will focus on the technique of linear regression and explain the principles behind it. We will discuss its most popular variants and gain practical experience through a lab session.

Required reading

- Abbott, D. (2014). Chapter 8: Predictive Modeling. In *Applied Predictive Analytics: Principles and Techniques for the Professional Data Analyst* (pp. 271-279). Indianapolis, IN: Wiley. [9 pages / Good introduction to the linear regression.]

Supplementary reading

- Field, A. (2018). Chapter 7: Regression. In *Discovering Statistics using IBM SPSS* (3rd ed., pp. 197-211). London: Sage Publications. [15 pages / Good introduction to regression that requires some basic knowledge of statistics.]
- Nelli, F. (2015). Appendix B: Open Data Sources. In *Python Data Analytics: Data Analysis and Science Using Pandas, Matplotlib and the Python Programming Language* (pp. 327-330). Berlin: Springer-Verlag. [4 pages / Overview of different open data sources for use in potential experiments.]
- Urdan, T. C. (2017). Chapter 13: Regression. In *Statistics in Plain English* (pp. 145-160). New York, NY: Routledge, Taylor & Francis Group. [16 pages / Good introduction to regression that requires some basic knowledge of statistics.]

3. Predictive analytics (part 2)

In the second lecture on predictive analytics, we will focus on the problem of classification, i.e., predicting which of a pre-defined set of classes/labels/groups/types apply to a particular data point. For example, classifiers can be used to classify mortgage customers as good (full mortgage paid back on time) and bad (delayed pay-back).

In particular, we will focus on two algorithms: decision tree learning and the k-Nearest Neighbor algorithm. We will go through the principles behind both algorithms and gain practical experience applying them to data through a lab session.

Required reading

- Abbott, D. (2014). Chapter 8: Predictive Modeling. In *Applied Predictive Analytics: Principles and Techniques for*

the Professional Data Analyst (pp. 213-222, 254-263). Indianapolis, IN: Wiley. [20 pages / Useful introductions to decision tree learning and the k-Nearest Neighbor algorithm.]

- Rokach, L., & Maimon, O. (2015). Chapter 1: Introduction to Decision Trees. In *Data Mining with Decision Trees: Theory and Applications* (2nd ed., Vol. 81, Series in Machine Perception and Artificial Intelligence, pp. 1-16). London: World Scientific Publishing. [16 pages / Part of the introduction to decision tree learning.]
- Rokach, L., & Maimon, O. (2015). Chapter 2: Training Decision Trees. In *Data Mining with Decision Trees: Theory and Applications* (2nd ed., Vol. 81, Series in Machine Perception and Artificial Intelligence, pp. 17-21). London: World Scientific Publishing. [5 pages / Part of the introduction to decision tree learning.]
- Yee, S., & Chu, T. (2015, July 27). A visual introduction to machine learning. Retrieved August 19, 2017, from http://www.r2d3.us/visual-intro-to-machine-learning-part-1/ [16 pages / Amazingly intuivive visual explanation of how decision tree learning works; watch this before reading anything else about decision trees.]

Supplementary reading

- Chorianopoulos, A. (2016). Chapter 4: Classification algorithms. In *Effective CRM using Predictive Analytics* (pp. 145-157). Chichester, West Sussex: Wiley. [13 pages / Additional introductory text for decision tree learning, but with more (mathematical) specifics on the different elements of the algorithm.]
- Larose, D. T., & Larose, C. D. (2015). Chapter 10: k-Nearest Neighbor Algorithm. In *Data Mining and Predictive Analytics* (pp. 301-312). Hoboken, NJ: Wiley. [12 pages / Alternative, slightly more technical introduction to the k-Nearest Neighbor algorithm.]
- Mitchell, T. M. (1997). Chapter 3: Decision tree learning. In *Machine Learning* (pp. 52-60). New York: McGraw-Hill [9 pages / Extensive description of the decision tree algorithm from Mitchell's seminal textbook.]
- Mitchell, T. M. (1997). Chapter 8: Instance-based learning. In *Machine Learning* (pp. 230-236). New York: McGraw-Hill [7 pages / Extensive description of the k-Nearest Neighbor algorithm from Mitchell's seminal textbook.]
- Rokach, L., & Maimon, O. (2015). Chapter 7: Popular Decision Trees Induction Algorithms. In *Data Mining with Decision Trees: Theory and Applications* (2nd ed., Vol. 81, Series in Machine Perception and Artificial Intelligence, pp. 77-83). London: World Scientific Publishing. [7 pages / Overview of the different types of decision tree algorithms.]

4. Network analysis

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Required reading

- ?

Supplementary reading

- ?

5. Clustering & visualization

This lecture will introduce students to the basic concepts behind clustering and visualization of data: how can we detect and visualize groups of similar items in a large data set? The lab session has students gain hands-on experience with clustering & visualization using specialized software.

Required reading

- Tan, P.-N., Steinbach, M. & Kumar, V. (2006). Chapter 8: Cluster Analysis: Basic Concepts and Algorithms. In *Introduction to Data Mining* (pp. 487-568). Harlow: Addison Wesley. [82 pages / Introduction to clustering algorithms.]

6. Additional topics

The exact contents of this lecture are dependent on the problems that the semester's case client has. Depending on the research questions and the available data, methods that could be discussed could be algorithms for recommendation, text mining, personalization, etc.

Required reading

- TBA

Supplementary reading

- TBA

Literature

	Req. reading (#pages)	Sup. reading (#pages)	Upload
1. Intro to data analytics			
Foster, I., Ghani, R., Jarmin, R. S., Kreuter, F., & Lane, J. (2017). Chapter 6: Machine Learning. In *Big Data and Social Science: A Practical Guide to Methods and Tools* (pp. 147-186). Boca Raton, FL: CRC Press Taylor & Francis Group	40		✓
2. Predictive analytics (part 1)			
Abbott, D. (2014). Chapter 8: Predictive Modeling. In *Applied Predictive Analytics: Principles and Techniques for the Professional Data Analyst* (pp. 271-279). Indianapolis, IN: Wiley.	9		✓
Field, A. (2018). Chapter 7: Regression. In *Discovering Statistics using IBM SPSS* (3rd ed., pp. 197-211). London: Sage Publications.		15	✓
Nelli, F. (2015). Appendix B: Open Data Sources. In *Python Data Analytics: Data Analysis and Science Using Pandas, Matplotlib and the Python Programming Language* (pp. 327-330). Berlin: Springer-Verlag.		4	✓
Urdan, T. C. (2017). Chapter 13: Regression. In *Statistics in Plain English* (pp. 145-160). New York, NY: Routledge, Taylor & Francis Group.		16	✓
3. Predictive analytics (part 2)			
Abbott, D. (2014). Chapter 8: Predictive Modeling. In *Applied Predictive Analytics: Principles and Techniques for the Professional Data Analyst* (pp. 213-222, 254-263). Indianapolis, IN: Wiley.	20		✓
Rokach, L., & Maimon, O. (2015). Chapter 1: Introduction to Decision Trees. In *Data Mining with Decision Trees: Theory and Applications* (2nd ed., Vol. 81, Series in Machine Perception and Artificial Intelligence, pp. 1-16). London: World Scientific Publishing.	16		✓
Rokach, L., & Maimon, O. (2015). Chapter 2: Training Decision Trees. In *Data Mining with Decision Trees: Theory and Applications* (2nd ed., Vol. 81, Series in Machine Perception and Artificial Intelligence, pp. 17-21). London: World Scientific Publishing.	5		✓

Yee, S., & Chu, T. (2015, July 27). A visual introduction to machine learning. Retrieved August 19, 2017, from http://www.r2d3.us/visual-intro-to-machine-learning-part-1/	16		✓
Chorianopoulos, A. (2016). Chapter 4: Classification algorithms. In *Effective CRM using Predictive Analytics* (pp. 145-157). Chichester, West Sussex: Wiley.		13	✓
Larose, D. T., & Larose, C. D. (2015). Chapter 10: k-Nearest Neighbor Algorithm. In *Data Mining and Predictive Analytics* (pp. 301-312). Hoboken, NJ: Wiley.		12	✓
Mitchell, T. M. (1997). Chapter 3: Decision tree learning. In *Machine Learning* (pp. 52-60). New York: McGraw-Hill.		9	✓
Mitchell, T. M. (1997). Chapter 8: Instance-based learning. In *Machine Learning* (pp. 230-236). New York: McGraw-Hill.		7	✓
4. Network analysis			
5. Clustering & visualization			
Tan, P.-N., Steinbach, M. & Kumar, V. (2006). Chapter 8: Cluster Analysis: Basic Concepts and Algorithms. In *Introduction to Data Mining* (pp. 487-568). Harlow: Addison Wesley.	82		
6. Additional topics			
Total	**?**	**?**	

Examination

Internal individual oral exam in “Data Analytics & Visualization”. Students must submit a blog post with relevant data visualization and narration. Textual narration should be adapted to the format of a blog post and not exceed 1000 words. Students may submit the blog post in groups.

Duration of examination: 15 minutes per student and 5 minutes per group for assessment and announcement of result. 20 minutes in total for individual examinations.

Evaluation: Grading according to the 7-point scale. The study elements on which the examination is based is equivalent to 5 ECTS. The examination must demonstrate that the student can fulfil the objectives outlined above regarding knowledge and understanding, skills and competencies.