

ELTE RESEARCH CENTER FOR COMPUTATIONAL SOCIAL SCIENCE

INTRODUCTION

The Research Center for Computational Social Science (RC2S2) was established at the Institute of Empirical Studies at Eötvös Loránd University in 2018. The research group is lead by Dr.Ildikó Barna and Dr. Renáta Németh. Our research team uses data mining and text mining methods to analyze textual data available on the internet and digitalized offline texts. We also utilize network analysis and develop data visualization solutions. At the same time, it is important to maintain the classic social research tool, the survey because when used in combination with computational techniques, it provides a truly effective toolkit for studying society. Our research topics are diverse: the status and applications of data science in the social sciences, analysis of online forums on depression, political polarization and political publicity, politics of memory, online hate speech, analysis of historical documents, and sustainability discourses. We are convinced that the computational trend will be inescapable in the coming decades of sociology.

The ELTE RC2S2 research group aims to exploit computational social science in the discovery of content-based sociological knowledge and the development of new methods, with the intention of contributing to practice-oriented solutions to social issues

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RESEARCH METHODOLOGY Computational Social Science

The data revolution that has taken place in recent decades and the digital data generated by our everyday activities became a socially relevant source of information in a wide variety of fields. In response to this, the methodology of quantitative social research has expanded considerably by adopting methods of computer science and artificial intelligence research. This new research area is called computational social science in international literature. At the same time, the digital revolution not only brought new data sources but has also transformed the society. As sociologists, our goal is to get to know this new type of society.

Computational Methods

Computational methods include data science (machine learning, text analytics), network analysis and data visualization. The main focus of our research group is natural language processing, with research experience in the analysis of online textual data and historical documents.

Survey Methods We aim to redefine social research methods, by the organic incorporation of data science know-how into survey methods and the combined application of qualitative and quantitative analysis. The new computational approach should be regarded as a complement and not a replacement of the traditional methods. Survey data and digital data together may present social research a flexible and broad enough empirical base.

Social Theory Building We focus on conducting empirical research instead of using data-driven approach. We use knowledge-driven science for theory buliding. By testing theoretical and conceptual models, we aim to produce scientific knowledge to understand better the profound changes in our contemporary society, while also contributing to solutions to societal issues.

PAST AND ONGOING RELEVANT PROJECTS INCLUDE Data Science in Social Research

One of the main challenges in the application of data analytics in sociology is the institutionalization of data science outside of sociology, as the former authority of sociology was based on its own research methods. Another key challenge is epistemological in nature and relates to the issue of reliability and validity of digital data and the question of explanation/causation. The challenges can be answered by redefining the foundations of sociological methodology, by the organic incorporation of data science know-how into its own methods.

Digital Lens

Our research group, established in 2021, work with innovative methods of digital history and computational social science. We analyze the testimonies of previously deported Hungarian Holocaust survivors recorded by the National Committee for Attending Deportees (DEGOB) in 1945–1946 We deal with the most important features of the language used by Jewish survivors, the topography of persecution and survival, and the typical gendered experiences of women and men.

Discursive framing of depression in online health communities

A current question in sociology is how mental disorders are framed by health professionals and the patients themselves or how therapists' reinterpretation of the disease shifts the social suffering towards suffering linked to the self. We are convinced that the patient-generated non-clinical texts offer great opportunities investigate this issue.

Entity-level emotion detection using a language model trained on human-annotated texts

Our goal is to build a Hungarian language model that is able to classify sentiments and specific emotions associated with actors. Sentiment analysis in combination with human annotated Named Entity Recognition, is suitable for an analysis in which the object of the sentiment can be identified.

Memory politics

Remembrance and memorialization are central topics of political discourse in Hungary. We explore, among other things, how political actors (re)interpret these collective traumas and what is at stake in the populist "re-nationalization" of memory politics.

Online Antisemitism

Representative surveys show that about one-third of the Hungarian population is considered antisemitic. The online form of antisemitism has become particularly prevalent in recent decades. NLP can be used not only to explore the structure, the main topics and actors of overt antisemitism but also to gain insights into the characteristics of covert forms.

Sustainability as a public policy issue

This research aims to assess whether and to what extent sustainability is reflected in the press and political public sphere. The importance of this research is not only driven by the challenge of climate change, but also by the growing role of the online public and technological advances that facilitate automated text processing.

Sociological analysis of the official and online political public using NLP

The overall aim of the research is to map the Hungarian online political public sphere from the early 2000s to the present. We analyze different layers of political discourse, including official channels of political communication, press and user-generated content, with the primary aim of showing the linguistic manifestations of political polarization.

PHD DISSERTATIONS

Jakab Buda – Explainable neural language models and their application in social sciences (Supervisor: Renáta Németh, PhD)

Eszter Katona – Natural Language Processing in Corruption Research: new data sources, new methods, new questions (Supervisors: Renáta Németh, PhD and Mihály Fazekas, PhD)

Árpád Knap – Application and Interpretation of Natural Language Processing Models in Social Sciences (Supervisor: Ildikó Barna, PhD)

Zsófia Rakovics – Sociological study of language polarization (Supervisors: Renáta Németh, PhD, Domonkos Sik, PhD)

Emese Tímea Tóth – Analyzing sustainability in the triad of political publicity, online media platforms and the lay public (Supervisor: János Balázs Kocsis, PhD)

GRANTS

New National Excellence Program

Eszter Katona – The hidden barriers of open competition. Using text mining to explore barriers to competition in public procurement (2022–2023, Supervisors: Renáta Németh, PhD, Mihály Fazekas, PhD)

Eszter Katona – Corruption risk and prediction. Analysis of public procurement tender texts using natural language processing tools (2020–2021, Supervisor: Mihály Fazekas, PhD)

Eszter Katona – Natural Language Processing in corruption research. Actors, data sources, techniques (2019–2020, Supervisor: Renáta Németh, PhD)

Eszter Katona – Perceptions of corruption. Topic modelling in social sciences (2018–2019, Supervisor: Renáta Németh, PhD)

Árpád Knap – Examination of the Application of Supervised Text Classification Methods in Social Sciences (2021–2022, Supervisor: Zoltán Kmetty, PhD)

Árpád Knap – Analysis of Emotions Related to Twentieth Century Traumas Using Text Analytical Methods (2020–2021, Supervisor: Ildikó Barna, PhD)

Zsófia Rakovics – Examining the linguistic and political polarization of parlamentary speeches (2022–2023, Supervisor: Domonkos Sik, PhD)

Emese Tímea Tóth – Narrative possibilities framed by political polarisation. Sustainability in online media platforms (2022–2023, Supervisor: Renáta Németh, PhD)

Emese Tímea Tóth – How has COVID-19 pandemic redefined the concept of sustainability in the lay public? Narratives and communication strategies (2021–2022, Supervisor: János Balázs Kocsis, PhD)

Anonymous Grant

Ildikó Barna, PhD – Revisiting Early Testimonies of Hungarian Jewish Holocaust Survivors through a Digital Lens (2021–2024)

CENTRAL (Central European Network for Teaching and Research in Academic Liaison)

Ildikó Barna, PhD – Memory policy in theoretical and practical dimensions (2021)

Ildikó Barna, PhD – Notion and construction of victimhood in Central East and Southeast Europe (2022)

Erasmus + Jean Monnet Network

Ildikó Barna, PhD – European Memory Politics – Populism, Nationalism, and the Challenges to a European Memory Culture (2020–2023)

National Laboratory for Social Innovation

Domonkos Sik, PhD – Mapping and optimalisation of online depression forums (2021-2022)

National Research, Development and Innovation Office

Renáta Németh, PhD - The layers of the political public sphere in Hungary (2001–2020) (2020-2023)

EÖTVÖS LORÁND UNIVERSITY

ELTE is Hungary's most prestigious university with the highest international rankings in the country. With 9 faculties, 112 master's degree programs, more than 104 foreign-language programs, 16 PhD schools with 128 programs, 33 307 students from more than 109 countries ELTE offers the widest range of higher education in Hungary with more than 80 running international projects.



If you are interested, do not hesitate to contact us: Ildikó Barna, Phd (co-leader): <u>barna.ildiko@tatk.elte.hu</u> <i>Renáta Németh, Phd (co-leader): <u>nemeth.renata@tatk.elte.hu</u>