

## Research Interests

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My research is investigating effects of big data algorithms on various web services. It has never been easier for companies to collect large-scale data about users both in the online and offline world, and use this data to customize online content. The first part of my research is to reverse engineer how these algorithms shape user content and what data is input to them. Beyond that, I want to know how new types of mechanisms such as online social ties, public feedback systems, search and recommendation algorithms change socio-economical processes, and how they impact society in a long term. I believe that it is important to bring transparency to these systems and educate society about the risk of sharing personal data and receiving personalized content. My most recent projects focus on online job markets, in which personalization and recommendation algorithms might reinforce cultural biases and lead to inequalities.

## Education

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### Postdoctoral Fellow

2016 – Present

CNS at CEU

Gendered Creative Teams project sponsored by the Intellectual Themes Initiative

### Ph.D. Candidate, Computer Science

2010 – 2016

Northeastern University

Advisors: Alan Mislove and David Lazer

### B.S., Applied Math

2005 – 2010

Eotvos Lorand University, Hungary

Advisor: Katalin Vesztegombi

Thesis: Crossing Numbers and Related Problems of Unit Distances in the Plane

## Research Projects

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### Measuring Bias in Online Labor Markets

2015 – Present

NEU and GESIS, Köln

Labor economy has been through a lot of structural changes in the past years. People use various online services to find employment, advertise freelance services, collaborate on projects, outsource work, etc. These online sites offer innovative mechanisms for organizing employment or hiring processes and may alter many of the social forces known to cause social inequality in traditional labor markets. In my work I investigate the mechanism that emerge in this new ecosystem and their potential for creating or reinforcing gender and racial biases. I am especially interested in the impact of tools that differentiate new online services from traditional labor markets, e.g. public social feedback or the use of big data algorithms in search and recommendation.

### Fact-checking Interventions on OSNs

2013 – 2014

Northeastern University

The prevalence of misinformation within social media and online communities can undermine public security and distract attention from important issues. Fact-checking interventions, in which users cite fact-checking websites such as Snopes.com and Factcheck.org, are a strategy users can employ to refute false claims made by their peers. We use data from Online Social Networks such as Twitter to find these conversations and to examine the contexts and consequences of fact-checking interventions.

### Price Discrimination on E-commerce Sites

2013 – 2015

Northeastern University

In this project we are measuring the extent to which online purchasing sites vary the prices and the products they show to their customers. There are many ways in which these websites are able to influence the final

purchase of users, and many factors based on which they can personalize the pool of products they offer. Our investigations include measurements on real users as well as simulations of browsing on some of the biggest e-commerce and travel sites.

### **Measuring Personalization of Web Search**

**2011 – 2013**

**Northeastern University**

We investigate the effect of personalization in Web search. The contribution of our work is three-fold; first, we develop a methodology to measure the extent of personalization, second, we apply this methodology to real-life user sessions in Google Web Search, and third, investigate the cause of personalization covering user-provided profile information, Web browser and operating system choice, search history, search-result-click history, and browsing history.

## **Professional Experience**

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### **Research Intern**

**2015**

**Prezi, Budapest, Hungary**

In this 5 months internship with Prezi's 'Reuse' team I was responsible for first, collecting and analyzing user behavioral data (on a ~50 million user base) and second, leveraged these results to develop algorithms for better content search and recommendation on Prezi's website.

### **Research Intern**

**2013**

**HP Labs, Social Computing Group**

Mentors: Bernardo Huberman, Sitaram Asur

In this project I worked on developing data mining methods to measure consumer opinions from micro-blogging data. The final product allows us to analyze tweets in a live manner, detect possible crises and have an overview on the temporal patterns of consumer sentiment.

### **External Researcher**

**2011 - 2012**

**Maven Seven, Budapest, Hungary**

Principal Investigator: Albert-Laszlo Barabasi

The goal of the project I was involved in at Maven7 was to map and analyze the community of Hungarians living in Boston. We achieved an extensive understanding over the communities and cultural trends by combining online data collection with the traditional data methods used in sociology and by using various social network analysis and data mining methods on the gathered data.

## **Publications**

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### **Selected Papers:**

A. Hannak, C. Wagner, D. Garcia, A. Mislove, M. Strohmaier and C. Wilson: **Bias in Online Freelance Marketplaces: Evidence from TaskRabbit and Fiverr**, In Proceedings of the 20th ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2017), Portland, OR, February, 2017.

A. Hannak, G. Soeller, D. Lazer, A. Mislove, C. Wilson: **Measuring Price Discrimination and Steering on E-commerce Sites**, In Proceedings of the 14th ACM/USENIX Internet Measurement Conference (IMC'14), Vancouver Canada, November 2014

A. Hannak, D. Margolin, B. Keegan, I. Webers: **Get back! You don't know me like that: The social mediation of fact-checking interventions in Twitter**, In Proceedings of the 8th International AAAI Conference on Weblogs and Social Media (ICWSM'14), Ann Arbor, MI, June 2014

A. Hannak, P. Sapiezynski, A. Molavi Kakhki, B. Krishnamurthy, D. Lazer, A. Mislove, C. Wilson: **Measuring Personalization of Web Search**, Proceedings of the 22nd International World Wide Web Conference (WWW'13), Rio de Janeiro, Brazil, May 2013

A. Hannak, E. Anderson, L. F. Barrett, S. Lehmann, A. Mislove, and M. Riedewald **Tweetin' in the Rain: Exploring societal-scale effects of weather on mood.**  
In Proceedings of the 6th International AAAI Conference on Weblogs and Social Media (ICWSM'12), Dublin, Ireland, June 2012

## Teaching Experience

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<b>Lecturer</b>	<b>2015 Fall</b>	<b>AIT, Budapest</b>
Datamining course for American exchange students		
<b>Teaching Assistant</b>	<b>2011 Spring</b>	<b>Northeastern University</b>
Logic and Computation - introduction to formal logic for undergraduate students		
<b>Teaching Assistant</b>	<b>2010 Fall</b>	<b>Northeastern University</b>
Discrete Structures - introductory course to mathematics, logic and computer science for undergraduates		

## Skills

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Platforms:	Mac OS X, Linux
Programming Languages:	Python, bash, JavaScript, HTML, MySQL
Other Tools:	Latex, Weka, AWS, RedShift, Gnuplot, ElasticSearch, Pandas, Hadoop, Pig
Languages:	Hungarian (native), English (fluent), German (fluent), Italian (beginner)

## References

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**Alan Mislove** (advisor)  
Assistant Professor, College of Computer and Information Science, Northeastern University  
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**David Lazer** (advisor)  
Full Professor, Department of Political Science and College of Computer and Information Science, Northeastern University  
Visiting Scholar, John F. Kennedy School of Government, Harvard University  
[davelazer@gmail.com](mailto:davelazer@gmail.com)

**Christo Wilson**  
Assistant Professor, College of Computer and Information Science, Northeastern University  
[cbw@ccs.neu.edu](mailto:cbw@ccs.neu.edu)