UNIVERSITY OF PASSAU
Faculty of Business Administration and Economics

A cordial invitation to a presentation in the
Brown Bag Seminar
Recent Developments in Data Science:

Towards Sustainable Development Goals via algorithmic auditing and impact assessment

By
Dr. Lisette Espín-Noboa

Date:	29.06.2023 (Thursday) at 12:30
Location:	R 301 WIWI
Link and further information:	Course 39740 Seminar: Doctoral Seminar "Recent Developments in Data Science" in Stud.IP

https://www.wiwi.uni-passau.de/csm/brown-bag-seminar-rdds

Abstract:

The UN's 17 Sustainable Development Goals (SDGs) tackle the urgent global issues of *poverty*, hunger, *inequality*, climate change, and environmental degradation. This talk examines the concepts of *algorithmic auditing* and *impact assessment* to delve into the examination of biases in algorithms and society. It explores how the understanding of "where biases come from" can be utilized to ensure that algorithm deployment is in line with the SDGs' objectives.

The first part of this talk establishes the foundation by introducing *algorithmic auditing* and *impact assessment*. Subsequently, in the second and third part, practical applications of these methods are demonstrated in the context of *poverty reduction* and addressing *social inequalities*, respectively.

Towards reducing poverty, we employ the inference of poverty maps to identify areas that require the greatest assistance. Our proposed machine learning pipeline utilizes satellite images, online crowd-sourcing, and social media metadata to accurately estimate wealth distribution in geographically clustered areas. By combining metadata features, our models excel at predicting wealth in rural regions, while image-based models are effective in identifying the highest wealth quintiles. This transparent and interpretable methodology provides valuable tools for governments and NGOs to make informed decisions in poverty reduction, considering data availability, urbanization level, and poverty thresholds.

To address social inequalities, this talk examines the auditing of three network-based algorithms: relational node classification, node ranking, and influence maximization. The focus is on identifying data patterns within social networks that explain the errors observed in the algorithm outputs. Additionally, two impact assessment studies are presented, highlighting how feedback-loops in recommender systems contribute to exacerbating inequalities in social networks. The presentation also explores the effectiveness of mitigation strategies, such as quotas, in reducing glass ceiling effects in rankings.

This talk aims to inspire researchers to embrace *algorithmic auditing* and *impact assessment* as tools for *social good* to promote accountable, explainable, and transparent algorithms.

Speaker: Dr. Lisette Espín-Noboa

Lisette Espín-Noboa is a postdoc at the Complexity Science Hub Vienna, and the Central European University. Her research interests lie within Computational Social Science at the intersection between Network Science and Artificial Intelligence for Social Good with special focus on the SDGs.

She received her PhD. in computer science on "Edge Formation and Its Influence in Machine Learning" in 2022 at the University of Koblenz-Landau, and her masters in computer science on "Inferring Topical Context for Tweets, Hashtags and Trending Topics on Twitter" at Saarland University. She also holds an engineering degree in computer science from Escuela Superior Politécnica del Litoral.

Her work has been published at the Web Conference (WWW), Nature Scientific Reports, and the journal of Applied Network Science. She has presented her work at multiple conferences and workshops such as WWW, IC2S2, NetSci, CCS, CompleNet, LXAI at NeurIPS and ICML.