



COLLEGE of ENGINEERING  
AND PHYSICAL SCIENCES

SCHOOL OF COMPUTER SCIENCE

## MSc Defence

**Wednesday August 14, 2024, at 1PM, Online via Zoom (remote)**

**Haleema Sheraz**

*Towards Stable Preferences for Stakeholder-aligned Machine Learning*

**Chair:** Dr. Gary Grewal

**Advisor:** Dr. Stefan Kremer

**Co-Advisor:** Dr. Joshua Skorborg (Philosophy)

**Non-Advisory:** Dr. Luiza Antonie

### Abstract:

In response to the pressing challenge of kidney allocation, characterized by growing demands for organs, this research sets out to develop a data-driven solution to this problem, which also incorporates stakeholder values. The primary objective of this research is to create a method for learning both individual and group-level preferences pertaining to kidney allocations, using data from the 'Pairwise Kidney Patient Online Survey'. Two distinct datasets are evaluated across three levels - Individual, Group and Stability – using machine learning classifiers through evaluation metrics. The Individual level data model predicts individual participant preferences, the Group level data model aggregates preferences across participants, and the Stability level data model, an extension of the Group level, evaluates the stability of these preferences over time.

The results show that while the Individual level data model outperforms both the Group and Stability level data model, however, there is evidence supporting the potential of the Stability level data model to capture preferences effectively. By incorporating stakeholder preferences into the kidney allocation process, we aspire to advance the ethical dimensions of organ transplantation, contributing to more transparent and equitable practices while promoting the integration of moral values into algorithmic decision-making.