Workshop Title: Fourth Workshop on Causal Reasoning and Explanation in Logic Programming

Workshop Description

Sophisticated causal reasoning has long been prevalent in human society and continues to have an undeniable impact on the advancement of science, technology, medicine, and other significant fields. From the development of ancient tools to modern roots of causal analysis in business and industry, reasoning about and understanding causality enables us to identify how an outcome of interest came to be and gives us insight into how to bring about, or even prevent, similar outcomes in future scenarios.

This workshop aims to bring together researchers and practitioners of logic programming with a dedicated focus on methods and trends emerging from the study of causality and explanation. We welcome the submission of papers on systems, tools, and applications of logic programming methods for causal reasoning and explanation. In particular, we encourage submissions presenting recent developments, including works in progress. The workshop will present the latest research and application developments in these areas and provide opportunities to discuss current and future research directions and relationships to other fields (e.g. Machine Learning, Diagnosis, Natural Language Processing and Understanding). An important expected outcome of this workshop is to collect first-hand feedback from the ICLP community about the role and placement of causal reasoning and explanation in the landscape of modern computer theory as well as in the software industry.

Topics of interests include (but are not limited to):

- Modeling causal theories in logic programming
- Formalization of types of causes: sufficient, necessary, actual, etc
- Causality, temporal reasoning and action theories
- Causality and counterfactual reasoning

- Causality and experimental design
- Causality and probability
- Causality and equivalence
- Causality and ontology
- Learning causal relations and information
- Novel causal benchmarks
- Relating LP based causality and Causal Networks
- Challenging problems and benchmark examples
- Justifications and argumentation
- Explainable AI
- Explanations for diagnosis and debugging
- Tools, systems and applications

Relevant Workshops in Previous Years:

1. 1st Workshop on Causal Reasoning and Explanation in Logic Programming (CAUSAL 2019), co-located with the 15th International Conference on Logic Programming and Nonmonotonic Reasoning (LPNMR 2019).

2. 2nd Workshop on Causal Reasoning and Explanation in Logic Programming (CAUSAL 2020), a workshop of the 36th International Conference on Logic Programming (ICLP 2020).

3. 3rd Workshop on Causal Reasoning and Explanation in Logic Programming (CAUSAL 2021), a workshop of the 37th International Conference on Logic Programming (ICLP 2021).

Committee contact:

- *(committee member info omitted)*

Proposed affiliated conference: ICLP 2022
Estimated workshop participants (based on expected growth over last year):

- **Expected number of submissions:** ~10
- **Expected number of attendees:** ~20+

Proposed format and agenda: Paper presentations, a panel discussion focusing on community research goals, (possible) demos, (possible) invited speaker
Potential invited speakers:

- Joseph Halpern, Cornell University
- Marc Denecker, KU Leuven

Procedures for selecting papers and participants: Blind review
Plans for dissemination: ICLP-22 workshop proceedings, special issue TPLP
Duration: 1 day
Preferred period (pre or post FLoC): No preference
Virtual/hybrid backup plans: We would likely use Zoom in the event of a virtual workshop