

## Selected publications

**A measure of structural complexity for programs.** tree width and rank width are measures for structural complexity of graphs

they are important as they give fixed-parameter tractability of checking MSO formulae on graphs

this work introduces monoidal width

Monoidal width is a measure of structural complexity for programs seen as morphisms in monoidal categories [DS23]. It captures tree width and rank width, by choosing suitable categorical algebras for graphs [DHS21].

the relevance of this work is the systematisation of fixed-parameter tractability results

this is explained in my phd thesis

following the initial suggestion of my phd advisor, I developed the theory and examples of this work

This work is the basis for my PhD thesis.

**Categorical syntax.** categorical structures give canonicity to syntactic constructions

why are Kleene bicategories interesting [BDD24]

why is partial Markov very cool [DR23]

**Up-to techniques for the (Co)induction proof principle.** coinduction is very cool

we do induction up-to [BDR24]

**Categorical semantics of reactive programs.** monoidal stream transducers [DdR22] won the Kleene award

feedback monoidal categories are neat [Di +23]

- [BDD24] Filippo Bonchi, Alessandro Di Giorgio, and Elena Di Lavore. “A diagrammatic algebra for program logics”. In: *to appear in: Proceedings of the International Conference on Foundations of Software Science and Computation Structures 2025*. 2024.
- [BDR24] Filippo Bonchi, Elena Di Lavore, and Anna Ricci. “Strong Induction is an up-to Technique”. In: *to appear in: Proceedings of Computer Science Logic 2025*. 2024.
- [Di +23] Elena Di Lavore, Alessandro Gianola, Mario Román, Nicoletta Sabadini, and Paweł Sobociński. “Span(Graph): a Canonical Feedback Algebra of Open Transition Systems”. In: *Software and Systems Modeling* 22 (2023), pp. 495–520. DOI: [10.1007/s10270-023-01092-7](https://doi.org/10.1007/s10270-023-01092-7). arXiv: 2010.10069 [math.CT].
- [DR23] Elena Di Lavore and Mario Román. “Evidential Decision Theory via Partial Markov Categories”. In: *2023 38th Annual ACM/IEEE Symposium on Logic in Computer Science (LICS)*. 2023, pp. 1–14. DOI: [10.1109/LICS56636.2023.10175776](https://doi.org/10.1109/LICS56636.2023.10175776).
- [DS23] Elena Di Lavore and Paweł Sobociński. “Monoidal Width”. In: *Logical Methods in Computer Science* 19 (3 Sept. 2023). DOI: [10.46298/lmcs-19\(3:15\)2023](https://doi.org/10.46298/lmcs-19(3:15)2023).
- [DdR22] Elena Di Lavore, Giovanni de Felice, and Mario Román. “Monoidal Streams for Dataflow Programming”. In: *Proceedings of the 37th Annual ACM/IEEE Symposium on Logic in Computer Science*. 2022, pp. 1–14. DOI: [10.1145/3531130.3533365](https://doi.org/10.1145/3531130.3533365). arXiv: 2202.02061 [cs.LO].

- [DHS21] Elena Di Lavore, Jules Hedges, and Paweł Sobociński. “Compositional Modelling of Network Games”. In: *29th EACSL Annual Conference on Computer Science Logic (CSL 2021)*. Ed. by Christel Baier and Jean Goubault-Larrecq. Vol. 183. Leibniz International Proceedings in Informatics (LIPIcs). Dagstuhl, Germany: Schloss Dagstuhl–Leibniz-Zentrum für Informatik, 2021, 30:1–30:24. ISBN: 978-3-95977-175-7. DOI: [10.4230/LIPIcs.CSL.2021.30](https://doi.org/10.4230/LIPIcs.CSL.2021.30). arXiv: [2006.03493](https://arxiv.org/abs/2006.03493) [cs.GT].