Chana Weil-Kennedy

Postdoctoral Researcher in Computer Science

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Work

2025 – present **Ingénieur-Chercheure**, *CEA-List*, Palaiseau, France

I am working on runtime verification of distributed systems, developing algorithms to check systems against communication protocols.

2023 – 2024 **Postdoctoral Researcher**, *IMDEA Software Institute*, Madrid, Spain

Member of Pierre Ganty's team.

I am continuing my work on parameterized verification of distributed systems, for systems communicating by broadcasts, registers and more. I also study the language inclusion problem, focusing on the wqo-approach developed in Pierre's group.

2018 – 2023 **PhD Student**, *Technical University of Munich*, Germany

Doctoral candidate under the supervision of Prof. Javier Esparza at the Chair for Foundations of Software Reliability and Theoretical Computer Science (Lehrstuhl VII). Officially employed as a Wissenschaftliche Mitarbeiterin (Scientific Staff).

I worked on parameterized verification of distributed protocols and concurrent systems, often modelled by Petri nets. Given a property and a system with an infinite state space, I examined the problem of checking whether the property holds for *any* input of the system. In particular, I studied the correctness problem for population protocols (introduced by Angluin et al.) and the reachability problem for certain classes of Petri nets with an observation component.

Education

2016 – 2018 **Master's Degree in Computer Science**, *École Normale Supérieure Paris-Saclay* (ex-ENS Cachan), France

MPRI (Master Parisien de Recherche en Informatique, or Parisian Master of Research in Computer Science)

2015 – 2016 **Master 1 in Mathematics**, *Université Paris-Sud*, France

Master in Fundamental Mathematics (Jacques Hadamard Program) + Magistère de mathématiques

2014 – 2015 **Bachelor of Mathematics**, *Université Paris-Sud*, France

Bachelor in Fundamental Mathematics (Jacques Hadamard Program) + Magistère de mathématiques

2012 – 2014 **Classes Préparatoires (CPGE) MPSI/MP**, *Lycée Lakanal*, Sceaux

Undergraduate course to prepare nationwide competitive exams in sciences

2012 **Scientific Baccalauréat (French high school diploma)**, *Lycée Magendie*, Bordeaux

Scientific Baccalauréat, with speciality in Mathematics

Internships and Projects

March 2018 to July 2018 **Internship**, *supervised by Pierre Ganty*, IMDEA Software Institute (Madrid)

This internship was centered on population protocols, a distributed protocol model in which identical mobile agents interact and compute a function by consensus. We studied the problem of verifying whether a given protocol correctly computes a function given any input. The results were published at CONCUR 2018.

May 2017 to August 2017 **Internship**, *supervised by Thomas Wies*, NYU (New York City)
This internship was centered on program verification and separation logic. We worked on a way of improving Thomas Wies's tool GRASShopper to make it more efficient. GRASShopper takes as input a program, explicits its memory specifications using separation logic and first-order logics, and then automatically checks them using SMT-solvers.

2016 **Project**, *supervised by Nicolas Ratazzi*, LRI (Université Paris-Sud)
Around Roth's theorem.

June 2015 **Internship**, *supervised by Nicolas Schabanel*, LIAFA (now IRIF, Université Paris Cité)
Around the proof of the PCP (Probabilistically Checkable Proof) theorem.

2015 **Project**, *supervised by Florent Jouve*, LRI (Université Paris-Sud)
Around expander graphs.

Publications

- *Temporal Hyperproperties for Population Protocols*, with Nicolas Waldburger, Pierre Ganty and César Sánchez, at FossaCS 2025.
- *Parameterized Verification of Systems with Precise (0,1)-Counter Abstraction*, with Paul Eichler and Swen Jacobs, at VMCAI 2025.
- *Verification of Population Protocols with Unordered Data*, with S. van Bergerem, R. Guttenberg, S. Kiefer, C. Mascle and N. Waldburger, at ICALP 2024.
- *A Uniform Framework for Language Inclusion Problems*, with Kyveli Doveri and Pierre Ganty, in Taming the Infinities of Concurrency: Essays Dedicated to Javier Esparza on the Occasion of His 60th Birthday, LNCS volume 14660, 2024.
- *Observation Petri Nets*, doctoral thesis, 2023.
- *Parameterized Analysis of Reconfigurable Broadcast Networks*, with A. R. Balasubramanian and Lucie Guillou at the FossaCS 2022 conference.
- *Reconfigurable Broadcast Networks and Asynchronous Shared-Memory Systems are Equivalent*, with A. R. Balasubramanian at the GandALF 2021 conference.
- *The Complexity of Verifying Population Protocols*, with Javier Esparza and Michael Raskin, in the journal Distributed Computing, volume 34, 2021.
- *Efficient Restrictions of Immediate Observation Petri Nets*, with Michael Raskin at the Reachability Problems 2020 conference.
- *Flatness and Complexity of Immediate Observation Petri Nets*, with Javier Esparza and Michael Raskin at the CONCUR 2020 conference.
- *Parameterized Analysis of Immediate Observation Petri Nets*, with Javier Esparza and Michael Raskin at the Petri Nets 2019 conference, **Best Paper Award**.
- *Verification of Immediate Observation Population Protocols*, with Javier Esparza, Pierre Ganty and Rupak Majumdar at the CONCUR 2018 conference.

Professional Activities

Reviewing I have reviewed papers for the conferences CONCUR, CAV, ICALP, FSTTCS, FoSSaCS, LICS, Petri Nets, MFCS, RP and ICTAC, and the journals Fundamenta Informaticae, STVR, LMCS and Science of Computer Programming. I was on the program committee of the 19th International Conference on Reachability Problem (RP 2025).

Talks I have given talks at Highlights (2019, 2020, 2021, 2022), at Infinity 2020 (satellite workshop of ICALP/LICS 2020), at different seminars, as well as at almost each conference in which my papers were accepted.

Teaching I have been a tutor for the Master's courses "Automata and Formal Languages", "Petri Nets" and "Fundamental Algorithms" several years in a row at the Technical University of Munich. This included devising new tutorial exercises, giving the tutorial classes, creating exams, supervising and grading exams. I also completed the Didactics for Informatics course offered by the TUM.

Student Supervision — I have supervised three Bachelor theses on extending the teaching tool "Automata Tutor" to Petri nets, by Arpad Botos, Felix Rinderer and Lilo Walter at the TUM. I have co-supervised a Master thesis on parameterized analysis of broadcast networks by Lucie Guillou of ENS Rennes.

Events — I co-organized the 2024 edition of Autobóz, a research week in which researchers gather to work on open problems, in Estonia. I co-organized the 2025 edition of the Logic Mentoring Workshop, co-located with LICS in Singapore.

Computer Skills

Python, OCaml, LaTeX, Z3, why3. Basic website building.

Awards

- Best Paper Award for "Parameterized Analysis of Immediate Observation Petri Nets" at the Petri Nets 2019 conference.
- "Prix de la vocation scientifique et technique des filles" (Scientific and Technological Vocational Award for Girls) given in 2012 by the Aquitaine region in France.

Languages

Bilingual — French, English (French and U.S. citizen)

Good level — German, Spanish

Other

Summer schools — I attended the Autobóz 2020, 2022, 2023 and 2024 workshops, the summer school on Verification Technology, Systems and Applications 2021 (Belgium), the Marktoberdorf Summer School 2019 (Germany), and the All Girls/All Math summer camp 2011 at the University of Nebraska-Lincoln (USA).

Volunteering — I helped out in a rural school in Alpartir (Spain) for one month in February 2023, with english and math classes.

Other jobs — Math and English tutor, Camp counsellor