

University of Southern Denmark  
Department of Mathematics and Computer Science  
Odense, Denmark

[dplyukhin.github.io](https://dplyukhin.github.io)  
[dplyukhin@imada.sdu.dk](mailto:dplyukhin@imada.sdu.dk)  
[@dplyukhin.bsky.social](https://@dplyukhin.bsky.social)

# Dan Plyukhin

**Languages:** English, French  
**Citizenship:** USA, Canada

## Research Interests

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Programming Languages, Distributed Systems, Choreographic Programming, Actors

## Education

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**Ph.D. Computer Science** at University of Illinois Urbana-Champaign (UIUC) ······ 2024  
*Thesis:* Fault-Tolerant and Fault-Recovering Garbage Collection for the Actor Model  
*Committee:* Gul Agha (chair), Indranil Gupta, Tianyin Xu, and Philip Haller

**Ba.Sc. Computer Science & Mathematics** at University of Toronto (U of T) ······ 2017  
Graduated honours with high distinction

## Academic Appointments

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**Postdoctoral Researcher** at University of Southern Denmark (SDU) ······ 2022–Present  
Supervised by Fabrizio Montesi

**Adjunct Professor** at Illinois Institute of Technology (Illinois Tech) ······ Fall 2021  
Sole instructor for CS 440: Programming Languages and Translators (60 students)

## Major Software Projects

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**UIGC** distributed actor GC for Apache Pekko ······ [github.com/dplyukhin/uigc-pekko](https://github.com/dplyukhin/uigc-pekko)  
Principal author and maintainer

**Choral** choreographic programming in Java ······ [github.com/choral-lang/choral](https://github.com/choral-lang/choral)  
Contributor, author of the *Ozone* concurrency library

## Publications

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### *Journal Articles*

**CRGC: Fault-Recovering Actor Garbage Collection in Pekko.** Dan Plyukhin, Gul Agha, and Fabrizio Montesi. *Proceedings of the ACM on Programming Languages* PLDI (2025). [doi.org/10.1145/3729288](https://doi.org/10.1145/3729288).

**Relax! The Semilenient Core of Choreographic Programming (Functional Pearl).** Dan Plyukhin, Xueying Qin, and Fabrizio Montesi. *Proceedings of the ACM on Programming Languages* ICFP (2025). [doi.org/10.1145/3747538](https://doi.org/10.1145/3747538).

**A Scalable Algorithm for Decentralized Actor Termination Detection.** Dan Plyukhin and Gul Agha. *Logical Methods in Computer Science* 1 (2022). [doi.org/10.46298/lmcs-18\(1:39\)2022](https://doi.org/10.46298/lmcs-18(1:39)2022).

### Peer-Reviewed Conference Papers

**Ozone: Fully Out-of-Order Choreographies.** Dan Plyukhin, Marco Peressotti, and Fabrizio Montesi. In: *38th European Conference on Object-Oriented Programming, ECOOP 2024*. doi.org/10.4230/LIPIcs.ECOOP.2024.31.

**Scalable Termination Detection for Distributed Actor Systems.** Dan Plyukhin and Gul Agha. In: *31st International Conference on Concurrency Theory, CONCUR 2020*. doi.org/10.4230/LIPIcs.CONCUR.2020.11.

### Peer-Reviewed Workshop Papers and Extended Abstracts

**Poroutines: The Essence of Choreographic Programming?** Dan Plyukhin. In: *1st International Workshop on Choreographic Programming, CP@PLDI 2024*. Extended abstract.

**Concurrent garbage collection in the actor model.** Dan Plyukhin and Gul Agha. In: *Proceedings of the 8th ACM SIGPLAN International Workshop on Programming Based on Actors, Agents, and Decentralized Control, AGERE!@SPLASH 2018*. doi.org/10.1145/3281366.3281368.

### Other Manuscripts

**One-Click Decentralisation: Automated Synthesis of Microservice Choreographies.** Viktor Strate Kløvedal, Dan Plyukhin, Marco Peressotti, and Fabrizio Montesi. (2025). In preparation for PLDI 2026.

**Fault-Tolerant and Fault-Recovering Garbage Collection for the Actor Model: A Collage-Based Approach.** Dan Plyukhin. PhD thesis. University of Illinois Urbana-Champaign, USA (2024). hdl.handle.net/2142/124328.

### Talks

(Excluding talks for the above papers)

**Web Architecture Through The Ages: From Servers to Microservices** ..... 2025  
Invited talk at *University of Regensburg* (Software Engineering I)

**Garbage Collection in Erlang vs JVM/Akka** ..... 2023  
Podcast guest on *Elixir Wizards* by SmartLogic

**Actors, GADTs, and Burnout** ..... 2023  
Podcast guest on *Type Theory Forall*

**A Language for Low-Latency Distributed Systems** ..... 2023  
Invited talk at *Purdue PurPL Seminar*

**Making It Easier to Implement Correct Distributed Algorithms** ..... 2022  
Student talk at *BehAPI Summer School*

**Capabilities for Flexible and Concurrent Garbage Collection of Actors** ..... 2018  
Contributed talk at *Midwest PL Summit 2018*

**An Introduction to Network Programming** ..... 2018  
Workshop at *Illinois CS SAIL* (high school outreach event)

## Teaching

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### *Instructor*

**CS 440: Programming Languages and Translators (Illinois Tech)** ..... Fall 2021  
Sole instructor of record with one TA. Taught 60 students, fully remote using Discord and PrairieLearn. Developed curriculum, assignments, and lectures. Teaching reviews available at: [dplyukhin.github.io/files/plyukhin-cs440-fa2021-evals.pdf](https://dplyukhin.github.io/files/plyukhin-cs440-fa2021-evals.pdf)

*Midterm instructor rating:* 4.52/5 (29 reviews, 48% response)

*Final instructor rating:* 4.40/5 (10 reviews, 17% response)

### *Teaching Assistant*

**CS 421: Programming Languages and Compilers (UIUC)** ..... 2017–2022  
Taught 9 semesters, both remote and in-person. Held office hours and contributed to course development on Coursera and PrairieLearn platforms.

**CS 425: Distributed Systems (UIUC)** ..... Fall 2019  
Online M.Sc. section, Coursera. Graded exams and assignments, held office hours.

**CSC 240: Enriched Theory of Computation (U of T)** ..... Spring 2017  
Taught a biweekly lab, graded assignments and exams, held office hours.

**CSC 324: Principles of Programming Languages (U of T)** ..... Fall 2016  
Taught a weekly lab, graded assignments and exams, held office hours.

**MAT 246: Abstract Mathematics (U of T)** ..... Spring 2016  
Taught a weekly lab, graded assignments and exams, held office hours.

## Supervision and Mentorship

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### *Masters*

**Malthe Hedelund Petersen (SDU)** principal supervisor, with Fabrizio Montesi .. 2026

**Christian Hviid Nesting (SDU)** principal supervisor, with Fabrizio Montesi ..... 2025

**Steven Kolbeck Ensted (SDU)** with Marco Peressotti and Fabrizio Montesi ..... 2024

**Jonas Bruun Plesner (SDU)** with Marco Peressotti and Fabrizio Montesi ..... 2024

**Mathias Jensen (SDU)** with Marco Peressotti and Fabrizio Montesi ..... 2024

### *Undergraduate*

**Charles Kuch (UIUC)** Undergraduate Research Mentorship Program ..... 2020

**Jerry Wu (UIUC)** Undergraduate Research Mentorship Program ..... 2020

## Honors and Awards

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**Outstanding Teaching Assistant Award (UIUC) (Nomination)** ..... 2022

**Outstanding Teaching Assistant Award (UIUC) (Nomination)** ..... 2021

**Outstanding Teaching Assistant Award (UIUC) (Nomination)** ..... 2019

Dean's List (U of T) .....	2017
Undergraduate Research Experience (U of T) ( <i>Research Grant</i> ) .....	2017
University College Special In-Course Scholarship (U of T) .....	2017
Dean's List (U of T) .....	2016
Dean's List (U of T) .....	2014

## Service

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### *Institutional*

External Reviewer for POPL .....	2025
External Reviewer for EXPRESS/SOS .....	2025
External Reviewer for JLAMP .....	2025
Program Committee Member for ICST (Poster Track) .....	2025
External Reviewer for Journal of Computer Languages .....	2023
External Reviewer for ISPDPC .....	2022
External Reviewer for JLAMP .....	2019
External Reviewer for COORDINATION .....	2018

### *Community*

Co-Host of the <i>Type Theory Forall</i> podcast .....	2023–Present
Seminar Organizer (SDU) for the <i>AICP Section</i> .....	2024–Present
Member (UIUC) of the <i>Education Justice Project (EJP)</i> .....	2021–2024
Mentor (UIUC) for the <i>Undergraduate Research Apprenticeship Program</i> ...	2019–2020
Instructor (UIUC) for the <i>CS SAIL</i> high school outreach event .....	2018
Seminar Organizer (U of T) for the <i>Undergraduate Theory Group (UTG)</i> .....	2015–2017