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

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DAN PLYUKHIN

Languages: English, French
Citizenship: USA, Canada

Research Interests

Programming Languages, Distributed Systems, Choreographic Programming, Actors

Education

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

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

UIGC fault-recovering actor GC for Apache Pekko · · · github.com/dplyukhin/uigc-pekko
Principal author and maintainer

Choral choreographic programming in Java · · · · · · · · · · · github.com/choral-lang/choral
Contributor, author of the *Ozone* library for intra-choreography concurrency

Publications

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.

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.

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.

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

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
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 section, taught on 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

Masters

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

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) (*Research Grant*) · · · · · · · · · · · · · · · 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

Institutional

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 ISPDC · 2022

External Reviewer for JLAMP · 2019

External Reviewer for COORDINATION · 2018

Community

Co-Host of the *Type Theory Forall* podcast · 2023–Present

Seminar Organizer (SDU) for the *AICP Section* · 2024–Present

Member (UIUC) of the *Education Justice Project (EJP)* · · · · · · · · · · · · · · · · · · 2021–2024

Mentor (UIUC) for the *Undergraduate Research Apprenticeship Program* · · · 2019–2020

Instructor (UIUC) for the *CS SAIL* high school outreach event · · · · · · · · · · · · · · · 2018

Seminar Organizer (U of T) for the *Undergraduate Theory Group (UTG)* · · · · · 2015–2017