University of Southern 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 distributed 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* concurrency library

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. *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. *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. *1st International Workshop on Choreographic Programming, CP@PLDI 2024*. Extended abstract.

Concurrent garbage collection in the actor model.
Dan Plyukhin and Gul Agha. *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.
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 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

Doctoral

Viktor Strate Kløvedal† (SDU) · · · · · 2024–Present

Masters

Malthe Hedelund Petersen⋆ (SDU) · · · · · 2025–2026

Christian Hviid Nesting⋆ (SDU) · · · · · 2024–2025

Steven Kolbeck Ensted† (SDU) · · · · · 2023–2024

Jonas Bruun Plesner† (SDU) · · · · · 2023–2024

Mathias Jensen† (SDU) · · · · · 2023–2024

Undergraduate

Charles Kuch⋆ (UIUC) · · · · · 2020

Jerry Wu⋆ (UIUC) · · · · · 2020

⋆: primary supervisor †: co-supervisor

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

Co-Chair for the *2nd Workshop on Choreographic Programming* at PLDI 2026 2026

Program Committee Member for ICST (Poster Track) 2025

External Reviewer for POPL 2026, EXPRESS/SOS 2025, JLAMP 2025, Journal of Computer Languages 2023, ISPDC 2022, JLAMP 2019, COORDINATION 2018 .....

Community

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

Seminar Organizer (SDU) for the *ACP 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

References

Gul Agha (UIUC) Research Professor and Professor Emeritus ..... agha@illinois.edu

Fabrizio Montesi (SDU) Full Professor ..... fmontesi@imada.sdu.dk

Mattox Beckman (UIUC) Teaching Associate Professor ..... mattox@illinois.edu

Tianyin Xu (UIUC) Associate Professor ..... tyxu@illinois.edu