Crystal Chang **Din**
Associate Professor

⌖ Bergen, Norway ✉ Crystal.Din@uib.no

Crystal Chang Din is an associate professor in computer science. Her research interests focus on concurrency, distributed systems, formal methods, program modeling, semantics, program logic, and deductive verification. She enjoys teaching and students evaluate her courses excellent.

Crystal holds a Ph.D. degree in informatics from University of Oslo, Norway, and an M.Sc. degree in computer science from Chalmers University of Technology, Sweden. After finishing her Ph.D., she had a postdoctoral position in Germany. She has lived in five countries and speaks English, Norwegian, and Mandarin. Her colleagues describe her as detail-oriented, organized, and goal-oriented. She is both a good leader and a participant in teams.

Experience

Associate professor, Dep. of Informatics, University of Bergen, Norway   2021-now
https://www.uib.no/en/persons/Crystal.Chang.Din

Postdoctoral researcher, Dep. of Informatics, University of Oslo, Norway   2016-2020

Postdoctoral researcher, Dep. of Computer Science, TU Darmstadt, Germany   2014-2016

PhD student, Dep. of Informatics, University of Oslo, Norway   2010-2014

Project assistant, Dep. of Computer Science, Chalmers University of Technology, Sweden   2009
I was a project assistant in the HATS project

Education

Ph.D. degree, Dep. of Informatics, University of Oslo, Norway   2014
Title of the dissertation: Verification of Asynchronously Communicating Objects.
Title of the trial lecture: Formal Verification of Real-Time Systems.

M.Sc. degree, Dep. of Computer Science, Chalmers University of Technology, Sweden   2009
Title of the dissertation: Testing Erlang/OTP with QuickCheck.

Projects

Geological Assistant   2019–2020
Funded by Sentre for Forskningsdrevet Innovasjon (SFI) and Schlumberger
My involvement: I am the main developer of the reasoning engine for the project. It is an interdisciplinary project. I collaborate with geologists, people with different computer science backgrounds, and people from Schlumberger and Equinor. Our work won the best scientific paper award at the NIK 2019 conference. Besides, we presented our work at 2019 Schlumberger SIS global forum in Monaco. SIS is the largest global forum of Schlumberger that is held every second year for all its customers. Our talk "Geological Multi-scenario Reasoning" can be found on SIS website: https://www.software.slb.com/sis-global-forum-2019.

LTEP, Long-Term Evolution Planning for Highly Variable Software Systems   2019–2020
Funded by NFR and DAAD
My involvement: striving for research in formal methods part of the project, supervising students, and collaborating with project partners in Germany. Our one year work has been submitted to two international conferences and are currently under review

CUMULUS, Semantics-based Analysis for Cloud-Aware Computing   2016–2019
Funded within NFR's FRINATEK framework
My involvement: Exploring a new semantics and proof system for active object languages

ENVISAGE, Engineering Virtualized Services   2013–2016
Funded by EU FP7 FET IP
My involvement: Leader of Task 3.2 - Verification

HATS, Highly Adaptable and Trustworthy Software using Formal Models   2009–2012
Funded by EU FP7 FET IP
My involvement: Developing a reasoning system for the ABS modelling language

Project Proposals Writing

Geological Multi-Scenario Reasoning (GeMS)   2018
Funding Programme: Petromaks2 - Research Council of Norway (NFR)

Program Committee and Chairs

NIK 2023 - Program Chair

iFM 2023 - PhD Symposium Chairs

NWPT 2022 - Local Organizer and Program Committee

SVT Track of SAC 2022 - Program Committee

TheWebConf 2022 - Program Committee

UDIT 2021 - Program Committe

ECOOP 2021 - Artifact Evaluation Committee

ICE 2016 - 9th Interaction and Concurrency Experience Satellite Workshop of DisCoTec - Program Committe

Guest Editor

NWPT Special Issue of Journal of Logical and Algebraic Methods in Programming (JLAMP)   2022

Teaching

Associate professor, Introduction to Operating Systems (given in Norwegian)   2023
Bachelor course, University of Bergen, Norway

Associate professor, Introduction to Programming (given in Norwegian)   2023
Bachelor course, University of Bergen, Norway

Associate professor, Introduction to Operating Systems   2022
Bachelor course, University of Bergen, Norway

Associate professor, Introduction to Programming (given in Norwegian)   2022
Bachelor course, University of Bergen, Norway

Associate professor, Introduction to Operating System (This course was created by me)   2021
Bachelor course, University of Bergen, Norway

Associate professor, Introduction to Programming (This course was created by me)   Jul.-Sep. 2019
International Summer School, Oslo Metropolitan University, Norway

Associate professor, Introduction to Programming (This course was created by me)   Jan.-April 2019
Bachelor course, Oslo Metropolitan University, Norway

Associate professor, Introduction to Programming (This course was created by me)   Jul.-Sep. 2018
International Summer School, Oslo Metropolitan University, Norway

Lecturer, Algorithms and Data Structures (step in for a two-hour lecture)   Sep. 2018
Bachelor course, University of Oslo, Norway

Lecturer, Introduction to Arduino board, programming languages and programming   Nov. 2017
environment (given in Norwegian)
Bachelor course, Oslo Metropolitan University, Norway

Lecturer, Decision Procedure seminar course   2014
Bachelor course, Technische Universität Darmstadt, Germany

Lecturer, Formal Verification of Real-Time Systems   2014
PhD defence trial lecture, University of Oslo, Norway

Lecturer, Models of Concurrency   2012
Master course INF4140, PhD course INF9145, University of Oslo, Norway

Teaching assistant, Models of Concurrency   2011
Master course INF4140, PhD course INF9145, University of Oslo, Norway

Lecturer, Symbolic CTL Model Checking   2010
Part of PhD course INF9140: Specification and Verification of Parallel Systems, University of Oslo, Norway

Teaching assistant, Models of Concurrency   2010
Master course INF4140, PhD course INF9145, University of Oslo, Norway

Master Theses Supervision

Andreas Røsæg (main-supervisor) defended in 2023
Thesis title: Specifying and Generating Actor-Based Computer Games

Ida Sandberg Motzfeldt (co-supervisor) defended in 2021
Thesis title: Modular Soundness Checking of Feature Model Evolution Plans

Eirik Halvard Sæther (co-supervisor) defended in 2021
Thesis title: Three-Way Semantic Merge for Feature Model Evolution Plans

Vegar Skaret (main-supervisor) defended in 2020
Thesis title: Knowledge Representation and Concretization of Underdetermined Data

Eduard Kamburjam (co-supervisor) defended in 2016
Thesis title: Session-Based Compositional Verification on Actor-based Concurrent Systems

Niken Fitria (co-supervisor) defended in 2015
Thesis title: Delta Relational Mapping in the Abstract Specification Behaviour Language

Ricky Gultom (co-supervisor), defended in 2014
Thesis title: Efficient Abstract Behavioral Specification-Based Testing Method for Software Product Lines

External Sensor for Master Theses Defense

Sondre Åge Godø Teigen defended at University of Oslo in December 2022
(supervisor: Martin Steffen, internal sensor: Violet Ka I Pun)
Thesis title: A Relaxed Memory Model Based On Message Passing and Delayed Evaluation of Shared Memory Operation
Knut Anders Stokke defended at University of Bergen in June 2020
(supervisor: Jaakko Järvi, internal sensor: Anya Helene Bagge)
Thesis title: Declaratively Programming the Dynamic Structure of Graphical User Interfaces

External Sensor for Bachelor Theses Defense

7 groups HVL(2023)

Scientific Review Work

Reviewing for journals
SoSyM(2020), FAC(2023)

Reviewing for conferences
FCT(2011), FSEN(2015), TACAS(2015), FM(2015), VSTTE(2015), ESOP(2016), iFM(2016), TASE(2016), FASE(2016), CPP (2017), SEFM (2017), FORTE (2018), SEFM (2018), FoSSaCS (2019), FASE (2019), SEFM(2020), ECOOP Artifacts(2021), iFM(2022), SVT(2022), FASE(2023), TACAS(2023), SAC-SRC(2023), SAC-SVT(2023), NIK(2023)

Reviewing for workshops
AGERE(2012), FTfJP(2015), iFM-PhD(2023)

Reviewing for master theses
1. Declaratively Programming the Dynamic Structure of Graphical User Interfaces (Spring 2020)
2. Boreas - Reducing Resource Usage Through Optimized Kubernetes Scheduling (Autumn 2019)
3. Visualization for the ABS Modeling Language (Autumn 2018)
4. The Cooperative Fire Fighters (Autumn 2017)
5. Using Metaheuristic Algorithms to Reconfigure Context-Aware Software (Spring 2017)

Presentation at EU Project Meetings

Envisage joint task meeting, Madrid, Spain	Feb. 2016
Envisage 2nd annual meeting, Amsterdam, Netherlands	May 2015
Envisage Joint task meeting, Madrid, Spain	Feb. 2015
Envisage Work Package 2 - Workshop co-located with international conferences iFM and FACS, Bertinoro, Italy	Sep. 2014
KeY project meeting, Bühl, Germany	Sep. 2014
Envisage Task meeting T3.4, Darmstadt, Germany	Aug. 2014
Envisage 1st annual meeting, Oslo, Norway	June 2014

Envisage Joint task meeting, Bologna, Italy   Jan. 2014

Presentation at Companies

SIRIUS project presentation at Schlumberger, Stavanger, Norway   2017
Title: Execution Modeling and Analysis

Invited Talks

Invited talk at Interdisciplinary Research in Logic (IRS) workshop at University of Bergen   December 2023
Title: Runtime Enforcement Using Knowledge Bases
Invited talk at Academia Sinica, Taipei, Taiwan, R.O.C.   July 2011
Title: Observable Behavior of Distributed Systems: Component Reasoning for Concurrent Object

Conference and Workshops Attended

Conferences

FM (2009), FoVeOOS (2010), NWPT (2010), SEFM (2012), NWPT (2012), NWPT (2013), MODELWARDS (2014), CADE (2015), ICFEM (2015), ICFEM (2016), NWPT (2016), SEFM (2018), NIK(2018), NIK(2019), SEFM(2019), FLoC(2022), ISoLA(2022), FASE(2023)

Workshops

Verification of Concurrent and Distributed Software: Towards Industrial Use at Lorentz Center, Leiden, Netherlands (2015)

Schools Attended

1. Nordic Spring School in Logic 2013
2. HATS International School on Formal Models for Components and Objects
3. Formosan Summer School on Logic, Language, and Computation (FLOLAC'11)
4. Marktoberdorf 2010 - Software and Systems Safety: Specification and Verification

Publications

[1] I. S. Motzfeldt, I. C. Yu, C. C. Din, V. K. I Pun, V. Stolz, *Modular Soundness Checking of Feature Model Evolution Plans*. Proc. of the 20th International Colloquium on Theoretical Aspects of Computing (ICTAC), Springer 2023.

[2] E. H. Sæther, I. C. Yu, C. C. Din, *Semantics-Based Version Control for Feature Model Evolution Plans*. Proc. of the 35th Norsk Informatikkonferanse 2023.

[3] E. Kamburjan, C. C. Din, *Runtime Enforcement Using Knowledge Bases*. Proc. of the 26th International Conference (FASE), Springer 2023.

[4] E. Kamburjan, C. C. Din, R. Schlatte, S. L. T. Tarifa, E. B. Johnsen, *Twinning-by-Construction: Ensuring Correctness for Self-Adaptive Digital Twins*. Proc. of the 11th International Symposium On Leveraging Applications of Formal Methods (ISoLA), Springer 2022.

[5] O. J. Abusdal, C. C. Din, V. K. I Pun, V. Stolz, *I Can See Clearly Now: Clairvoyant Assertions for Deadlock Checking*. In The Logic of Software - A Tasting Menu of Formal Methods, volume 13360 of LNCS, Springer 2022.

[6] I. C. Yu, I. Pene, C. C. Din, L. H. Karlsen, C. M. Nguyen, O. Stahl, A. Latif, *Subsurface Evaluation Through Multi-scenario Reasoning*. In: Patel, D. (eds) Interactive Data Processing and 3D Visualization of the Solid Earth. Springer 2022.

[7] C. C. Din, R. Hähnle, L. Henrio, E. B. Johnsen, K. I Pun, S. L. T. Tarifa, *LAGC Semantics of Concurrent Programming Languages*. CoRR abs/2202.12195 (2022)

[8] A. Hoff, M. Nieke, C. Seidl, E. H. Sæther, I. S. Motzfeldt, C. C. Din, I. C. Yu, I. Schaefer, *Consistency-preserving evolution planning on feature models*. Proc. of the 24th ACM International Systems and Software Product Line Conference 2020.

[9] E. Kamburjan, C. C. Din, R. Hähnle, E. B. Johnsen, *Behavioral Contracts for Cooperative Scheduling*. In Deductive Software Verification: Future Perspectives - Reflections on the Occasion of 20 Years of KeY, volume 12345 of LNCS, pages 85-121, Springer 2020

[10] C. C. Din, L. H. Karlsen, I. Pene, O. Stahl, I. C. Yu, T. Østerlie, *Geological Multi-scenario Reasoning*. Proc. of the 32th Norsk Informatikkonferanse 2019.

[11] A. Gkolfi, C. C. Din, E. B. Johnsen, M. Steffen, I. C. Yu, *Translating Active Objects into Colored Petri Nets for Communication Analysis*. Journal of Science of Computer Programming, 181:1-26, Elsevier 2019.

[12] E. Kamburjan, C. C. Din, R. Hähnle, E. B. Johnsen, *Asynchronous Cooperative Contracts for Cooperative Scheduling*. Proc. of the 17th Intl. Conf. on Software Engineering and Formal Methods (SEFM), pages 48-66, Springer 2019.

[13] C. C. Din, R. Schlatte, T. C. Chen, *Program Verification for Exception Handling on Active Objects using Futures*, Proc. of the 16th Intl. Conf. on Software Engineering and Formal Methods (SEFM), pages 73-88, Springer 2018.

[14] C. C. Din, J. Dovland, E. B. Johnsen, O. Owe, I. C. Yu, *A Modular Reasoning System Using Uninterpreted Predicates for Code Reuse*, Journal of Logical and Algebraic Methods in Programming (JLAMP), 95:82-102, Elsevier 2018.

[15] F. De Boer, V. Serbanescu, R. Hähnle, L. Henrio, J. Rochas, C. C. Din, E. B. Johnsen, M. Sirjani, E. Khamespanah, K. Fernandez-Reyes, A. M. Yang, *A Survey of Active Object Languages*. ACM Computing Surveys, 50(5):76:1-76:39, 2017

[16] A. Gkolfi, C. C. Din, E. B. Johnsen, M. Steffen, I. C. Yu, *Translating Active Objects into Colored Petri Nets for Communication Analysis*. Proc. in Fundamentals of Software Engineering - 7th International Conference (FSEN), pages 84-99, Springer 2017.

[17] C. C. Din, R. Hähnle, E. B. Johnsen, K. I Pun, S. L. T. Tarifa: *Locally Abstract, Globally Concrete Semantics of Concurrent Programming Languages*, Proc. of the 26th Intl. Conference on Automated Reasoning with Analytic Tableaux and Related Method (TABLEAUX), pages 22-43, Springer 2017.

[18] E. Kamburjan, C. C. Din, T. C. Chen, *Session-Based Compositional Analysis for Actor-Based Languages Using Futures*, Proc. of the 18th Intl. Conference on Formal Engineering Methods (ICFEM), pages 296-312, Springer 2016.

[19] C. C. Din, S. L. T. Tarifa, R. Hähnle, E. B. Johnsen, *History-Based Specification and Verification of Scalable Concurrent and Distributed Systems*, Proc. of the 17th Intl. Conference on Formal Engineering Methods (ICFEM), pages 217-233, Springer 2015.

[20] C. C. Din, R. Bubel, R. Hähnle, *KeY-ABS: A Deductive Verification Tool for the Concurrent Modelling Language ABS*, Proc. of the 25th Intl. Conference on Automated Deduction (CADE), pages 517-526, Springer 2015.

[21] R. Bubel, C. C. Din, R. Hähnle, K. Nakata, *A Dynamic Logic with Traces and Coinduction*, Proc. of the 24th Intl. Conference on Automated Reasoning with Analytic Tableaux and Related Methods (TABLEAUX), pages 307-322, Springer 2015.

[22] C. C. Din, O. Owe, *Compositional reasoning about active objects with shared futures*, Journal of Formal Aspects of Computing (FAOC), 27(3):551-572, 2015.

[23] C. C. Din, *Verification of Asynchronously Communicating Objects*, Ph.D. thesis, 2014.

[24] C. C. Din, O. Owe, *A sound and complete reasoning system for asynchronous communication with shared futures*, Journal of Logical and Algebraic Methods in Programming (JLAMP), 83(5-6):360-383, Elsevier 2014.

[25] C. C. Din, O. Owe, R. Bubel, *Runtime Assertion Checking and Theorem Proving for Concurrent and Distributed Systems*, Proc. of the 2nd Intl. Conference on Model-Driven Engineering and Software Development (MODELWARDS), pages 480-487, SCITEPRESS 2014.

[26] C. C. Din, J. Dovland, O. Owe, *Compositional Reasoning about Shared Futures*, Proc. of the 10th. Intl. Conf. on Software Engineering and Formal Methods (SEFM), LNCS-7504, pages 94-108, Springer 2012.

[27] C. C. Din, J. Dovland, E. B. Johnsen, O. Owe, *Observable behavior of distributed systems: Component reasoning for concurrent objects*, Journal of Logic and Algebraic Programming (JLAP), 81(3):227-256, Elsevier 2012.

[28] R. Bubel, C. C. Din, R. Hähnle, *Verification of Variable Software: an Experience Report*, Pre-proceedings. International Conference on Formal Verification of Object-Oriented Software (FoVeOOS), Paris, France, 2010.