# Curriculum Vitae (Updated Oct 2020) — Marten Lohstroh

**PERSONAL DATA**

Full Name:
Hendrik Marten Frank Lohstroh

Nationality: Dutch

**CONTACT INFO**

Address: 545Q Cory Hall
University of California
Berkeley CA 94720-1770

Phone: +1 (510) 282 9135
E-mail: marten@berkeley.edu
Github: github.com/lhstrh

**SUMMARY**

***Creative, enterprising, and collaborative computer scientist seeking opportunities for research and software development.***

**RESEARCH INTERESTS**

Models of Computation, Systems Design, Cyber-physical Systems, Concurrency, Distributed Systems, Programming Languages, Semantics, Type Systems, Information and Network Security, Privacy

**EDUCATION**

**PhD, Computer Science, UC Berkeley** (GPA: 3.85) **Dec 2020**

- Thesis: Reactors: A Deterministic Model of Concurrent Computation for Reactive Systems
- Major: Cyber-physical Systems
- Adviser: Prof. Edward A. Lee
- Minors: (I) Software Design & Testing (II) Privacy Law & Consumer Protections

**MSc, Grid Computing, University of Amsterdam** (cum laude) **Feb 2013**

- GPA: 3.93 (US) 8.4 (EU) [1]
- Visiting Student Researcher at UC Berkeley
- Thesis: Maximally Permissive Composition of Actors in Ptolemy II
- Adviser: Prof. Edward A. Lee

**BSc, Computer Science, University of Amsterdam** **Aug 2009**

- Thesis: User Based Policy Control of Attribute Authorities
- Adviser: Prof. Andy Pimentel

**AWARDS & HONORS**

- **Best Paper Candidate** Forum for Design Languages (FDL) **Sep 2020**
- **Best Paper Candidate** Design Automation and Test in Europe (DATE) **Apr 2020**
- **Qualcomm Innovation Fellowship Finalist** North America **Apr 2019**
- **Best Paper Award** Journal of Software and Systems Modeling **Oct 2018**
- **Best Presentation Award** at the 10th Biennial Ptolemy Miniconference **Oct 2013**
- Winner of the Joop Bautz **Information Security Award** **Oct 2008**

**PROFESSIONAL EXPERIENCE**

**University of California, Berkeley**, USA

**Postdoctoral Researcher** **Dec 2020 – Dec 2021**

- Continued research focused on reactors and LINGUA FRANCA.

**Graduate Student Researcher** **Aug 2014 – Dec 2020**

- Originated the reactor model of computation and developed a polyglot coordination language called LINGUA FRANCA for defining and composing reactors.

**Associate Specialist (Software Developer/Researcher)** **Dec 2012 – Aug 2014**

- Did research and software development in the Ptolemy project with a focus on Models of Computation, Industrial Cyber-physical Systems, and the Internet of Things.

**Toolsfordata**, Amsterdam, The Netherlands

**Founder, Software Developer** **May 2008 – Aug 2011**

- Designed and implementated Matchmaker, a Java-based application that finds semantically related records across different relational databases.

1. Grades translated in accordance with Nuffic guidelines (fact sheet).

**Questionmark**, Amsterdam, The Netherlands

**Software Developer, Systems Administrator** **Aug 2005 – Dec 2010**

- Implemented Information Retrieval applications in Java;
- Created and managed several websites;
- Managed enterprise network, workstations, and servers.

**Mucho Media**, Eindhoven, The Netherlands

**Web Programmer, Systems Administrator** **Aug 2002 – April 2004**

- Design and implementation of websites;
- Development of custom CMS solutions before frameworks existed;
- Management of enterprise network, workstations, and servers.

## TEACHING EXPERIENCE

**University of California, Berkeley**, USA

**Graduate Student Instructor** **Aug 2016 – May 2018**

- Instructor for CS164: Programming Languages and Compilers **Spring 2018**
  - Lead discussion sections, ran office hours, provided project support.
- Lab Instructor for EECS149: Introduction to Embedded Systems **Fall 2016**
  - Lead lab sections, ran office hours, provided project support.

**University of Amsterdam**, The Netherlands

**Teaching Assistant** **Oct 2007 – Jun 2011**

- **Instructor for Academic Skills** **2009, 2010, 2011**
  - Helped organize the course structure, development of exercises on i.a., LaTeX Typesetting and Revision Control.
- **Lab Instructor for Data Structures & Java Programming** **Spring 2008**
  - Supervised a weekly 3-hour lab with exercises on abstract data types, generics, and the Java Collections Framework;
  - Developed new course materials from scratch.
- **Lab Instructor for Telematics** **Spring 2008**
  - Supervised a weekly 3-hour lab on with exercises on the SMTP-protocol and a link-state routing protocol;
  - Developed supplementary course material.
- **Lab Instructor for Computer Systems for A.I.** **Fall 2007**
  - Supervised a weekly 3-hour lab with excercises on systems calls, compiler optimization, and reverse engineering of assembly code.

## PUBLICATIONS

► **DBLP**

► **Google Scholar**

- Citations: 289; h-index: 9; i10-index: 9.

### Books

Lohstroh, Marten, Patricia Derler, and Marjan Sirjani, eds. Principles of Modeling - Essays Dedicated to Edward A. Lee on the Occasion of His 60th Birthday. Vol. 10760. Lecture Notes in Computer Science. Springer, 2018. ISBN: 978-3-319-95245-1.

## Book Chapters

Lee, Edward A., Marten Lohstroh, and Yuhong Xiong. “The Type System.” In System Design, Modeling, and Simulation using Ptolemy II. Ptolemy.org, 2014.

## Conference Papers

Lohstroh, Marten, Christian Menard, Alexander Schulz-Rosengarten, Matthew Weber, Jeronimo Castrillon, and Edward A Lee. “A Language for Deterministic Coordination Across Multiple Timelines.” In 2020 Forum for Specification and Design Languages (FDL), 1–8. IEEE, 2020.

Menard, Christian, Andrés Goens, Marten Lohstroh, and Jerónimo Castrillón. “Achieving Determinism in Adaptive AUTOSAR.” In 2020 Design, Automation & Test in Europe Conference & Exhibition, DATE 2020, Grenoble, France, March 9-13, 2020, 822–827. IEEE, 2020.

Lohstroh, Marten, Íñigo Íncer Romeo, Andrés Goens, Patricia Derler, Jeronimo Castrillon, Edward A. Lee, and Alberto Sangiovanni-Vincentelli. “Reactors: A Deterministic Model for Composable Reactive Systems.” In Cyber Physical Systems. Model-Based Design, edited by Roger Chamberlain, Martin Edin Grimheden, and Walid Taha, 59–85. Cham: Springer International Publishing, 2019. ISBN: 978-3-030-41131-2.

Lohstroh, Marten, and Edward A. Lee. “Deterministic Actors.” In 2019 Forum for Specification and Design Languages, FDL 2019, Southampton, United Kingdom, September 2-4, 2019, edited by Tom J. Kazmierski, Reinhard von Hanxleden, and Terrence S. T. Mak, 1–8. IEEE, 2019.

Lohstroh, Marten, and Edward A. Lee. “Work-in-Progress: Real-Time Reactors in C.” In IEEE Real-Time Systems Symposium, RTSS 2019, Hong Kong, SAR, China, December 3-6, 2019, 572–575. IEEE, 2019.

Lohstroh, Marten, Martin Schoeberl, Andrés Goens, Armin Wasicek, Christopher Gill, Marjan Sirjani, and Edward A Lee. “Actors revisited for time-critical systems.” In 2019 56th ACM/IEEE Design Automation Conference (DAC), 1–4. IEEE, 2019.

Lohstroh, Marten, Martin Schoeberl, Mathieu Jan, Edward Wang, and Edward A. Lee. “Programs with ironclad timing guarantees: work-in-progress.” In Proceedings of the International Conference on Embedded Software Companion, New York, NY, USA, October 13-18, 2019, 1. ACM, 2019.

Lohstroh, Marten, Hokeun Kim, and Edward A Lee. “Work-in-progress: Contextual callbacks for resource discovery and trust negotiation on the Internet of Things.” In Embedded Software (EMSOFT), 2017 International Conference on, 1–2. IEEE, 2017.

Cremona, Fabio, Marten Lohstroh, David Broman, Marco Di Natale, Edward A Lee, and Stavros Tripakis. “Step revision in hybrid Co-simulation with FMI.” In Formal Methods and Models for System Design (MEMOCODE), 2016 ACM/IEEE International Conference on, 173–183. IEEE, 2016.

Cremona, Fabio, Marten Lohstroh, Stavros Tripakis, Christopher Brooks, and Edward A Lee. “FIDE: an FMI integrated development environment.” In Proceedings of the 31st Annual ACM Symposium on Applied Computing, 1759–1766. 2016.

Lohstroh, Marten, Christopher Brooks, and Edward A. Lee. “Demo Abstract: Building IoT Applications with Accessors in CapeCode.” In 2016 ACM/IEEE 7th International Conference on Cyber-Physical Systems (ICCPS), 1–1. April 2016.

Lohstroh, Marten, and Edward A Lee. “An interface theory for the Internet of Things.” In SEFM 2015 Collocated Workshops, 20–34. Springer, 2015.

## Journal Articles

Sehr, Martin A, Marten Lohstroh, Mathew Weber, Ines Ugalde, Martin Witte, Joerg Neidig, Stephan Hoeme, Mehrdad Niknami, and Edward A Lee. “Programmable Logic Controllers in the Context of Industry 4.0.” IEEE Transactions on Industrial Informatics, 2020.

Cremona, Fabio, Marten Lohstroh, David Broman, Edward A Lee, Michael Masin, and Stavros Tripakis. “Hybrid co-simulation: It’s about time.” (**Best Paper Award**), Software & Systems Modeling 18, no. 3 (2019): 1655–1679.

Lohstroh, Marten, Hokeun Kim, John C Eidson, Chadlia Jerad, Beth Osyk, and Edward A Lee. “On enabling technologies for the Internet of Important Things.” IEEE Access 7 (2019): 27244–27256.

Brooks, Christopher, Chadlia Jerad, Hokeun Kim, Edward A. Lee, Marten Lohstroh, Victor Nouvellet, Beth Osyk, and Matthew Weber. “A Component Architecture for the Internet of Things.” Proceedings of the IEEE 106, no. 9 (September 2018): 1527–1542. ISSN: 0018-9219.

Latronico, Elizabeth, Edward Lee, Marten Lohstroh, Chris Shaver, Armin Wasicek, and Matthew Weber. “A Vision of Swarmlets.” Internet Computing, IEEE 19, no. 2 (2015): 20–28.

## Preprints

Íncer Romeo, Íñigo, Marten Lohstroh, Antonio Iannopollo, Edward A Lee, and Alberto Sangiovanni-Vincentelli. “A Metric for Linear Temporal Logic.” 2019.

Lohstroh, Marten. “Why the Equifax Breach Should Not Have Mattered.” 2017.

## ELECTED POSITIONS & VOLUNTEERING

**University of California, Berkeley**, USA

### Peer Review

- **TPC Member** for Design Automation for CPS and IoT (DESTION) **2019 – 2020**
- Trans. on Computer-Aided Design of Integrated Circuits and Systems (TCAD) **2020**
- IEEE International Workshop on Signal Processing Systems (SiPS) **2020**
- Frontiers of Computer Science (FCS) **2019**
- ACM SIGBED International Conference on Embedded Software (EMSOFT) **2018**

### Edward A. Lee Festschrift — *Principles of Modeling*

- **Organizer/Program Chair** **Oct 2017**
- **Editor** of proceedings (Springer LNCS Festschrift Volume 10760) **May 2018**

### The Graduate Assembly (GA) **Sep 2015 – May 2018**

- Delegate of the EECS Department
  - First author of Resolution 1510D on *Accessible Healthcare*; and
  - Co-author of Resolution 1611D on *Basic Needs Security*.
- **Member of the GA’s Basic Needs Security Workgroup** **Sep 2016 – May 2018**
- **Member of the GA’s Governance Workgroup** **Nov 2017 – May 2018**

### Campus Committees

- **Student Health Advisory Comittee (SHAC)** **Sep 2015 – May 2016**
- **Student Health Insurance Advisory Comittee (SHIAC)** **Sep 2015 – May 2018**

**University of Amsterdam**, The Netherlands

**Educational Board of Computer Science** **Feb 2008 – Aug 2011**

- Annually reviewed the exam regulations;
- Co-authored fraud regulations.

**Curriculum Committee Computer Science** **Jun 2010 – Dec 2010**

- Helped design a new undergraduate curriculum.

## LANGUAGES

**Fluent**

- Dutch
- English

**Basic Knowledge**

- German
- French

## OPEN-SOURCE PROJECTS

**Lingua Franca** (github.com/icyphy/lingua-franca)
LINGUA FRANCA (LF) is a polyglot coordination Language and compiler toolchain for building deterministic concurrent and time-critical cyber-physical systems. The underlying Reactor model features a semantic notion of time that distinguishes logical timelines from physical ones, and establishes a well-defined relation between events across timelines. This mechanism can be leveraged in LF to guarantee deterministic program behavior under quantifiable assumptions.
The Xtext-based LF compiler has a commandline interface but is also accessible through a full-fledged Eclipse-based IDE. The compiler is implemented for the most part in Xtend and Java. The primary runtime engine is written in C. We also have support for a C++, TypeScript, and Python target.

**Reactor-TS** (github.com/icyphy/reactor-ts)
Reactor-TS is a runtime implementation for reactors in TypeScript. While it serves as a target for LF programs, Reactor-TS can also be used as a stand-alone framework (*sans* LF) for writing and executing reactor programs. The static type checking capability of TypeScript is used to ensure that reactor compositions are type-safe and reactions are well-typed.

**Ptolemy II** (ptolemy.berkeley.edu)
Ptolemy II is an open-source software framework supporting experimentation with actor-oriented design. Actors are software components that execute concurrently and communicate through messages sent via interconnected ports. A model is a hierarchical interconnection of actors. In Ptolemy II, the semantics of a model is not determined by the framework, but rather by a software component in the model called a director, which implements a model of computation. The Ptolemy Project has developed directors supporting process networks (PN), discrete-events (DE), dataflow (SDF), synchronous/reactive (SR), rendezvous-based models, 3-D visualization, and continuous-time models.

## REFERENCES

► **Edward A. Lee**
Professor Emeritus, Professor in the Graduate School

► **Alberto L. Sangiovanni-Vincentelli**
Professor, The Edgar L. and Harold H. Buttner Chair of EECS

► **Christopher X. Brooks**
Project Management Professional