

# LUCAS FORSTER

## Software Developer

📍 Aachen, Germany  
✉️ mail@lucasforster.com  
GitHub: [github.com/LucasForster](https://github.com/LucasForster)

🌐 [lucasforster.com](http://lucasforster.com)  
LinkedIn: [linkedin.com/in/lucasforster](https://linkedin.com/in/lucasforster)  
Xing: [xing.com/profile/lucas\\_forster](https://xing.com/profile/lucas_forster)



## EXPERIENCE

### Freelance

📅 Apr 2020 - ongoing

#### Full Stack Web Developer

My clients are mainly medium-sized companies from various industries. For the development of individual web applications I select the appropriate technologies after analyzing requirements. All development steps are implemented in close coordination with the client as well as involved internal and external developers. This ensures milestones are met and deployments are provided on schedule.

### Fraunhofer FIT

📅 Dec 2017 - Apr 2021

#### Student Research Assistant

Parallel to my studies, I started my career in the expert group for Intelligent Mobility. The chair develops information systems for transport associations and companies. My responsibilities consisted of the development of various frontend modules. Weekly meetings were held to coordinate the project development. The expert group for Cooperation Systems approached me with a new concept. They assigned me the responsibility for the development of a desktop client (see projects).

## PROJECTS

### Organization Platform for Event Broadcasts

#### Freelance

A globally active service provider for satellite and IP video transmissions wanted a web application to cover the organizational aspects associated with its broadcasting. For the transfer rights, it needed a secure access management with good handling. As a further requirement, the communication lining up to an event should be streamlined. For the platform I took an event sourcing approach and used WebSockets.

Event Sourcing   TypeScript   React   Material UI   Node.js  
Redis   Socket.io   S3 (AWS)   Heroku   Netlify

### Management of IoT-enabled Professional Devices

#### Freelance

A leading global supplier of medical devices requires the permanent ongoing development of its website, including a customer service area. The devices distributed are constantly transmitting data which is collected in the cloud. These are displayed in the service area for analytical and problem solving aspects. Furthermore, various support functions such as a ticket system are implemented.

TypeScript   React   Firebase (Google Cloud)   Prismic

## EDUCATION

Computer Science (B. Sc.)   📅 Sep 2021

#### RWTH Aachen University

Overall mark 2.6

- Mathematical and theoretical foundations
- Scientific research and writing
  - Low-level logic programming
  - Computer graphics
- Practical software courses (in teams)
  - Board Game AI
  - Microcontroller operating system
- Elective courses
  - Efficient Algorithms
  - Artificial Intelligence
  - Automata Theory
  - Technical English
- Physics as application subject

Final thesis on a topic in Intelligent Mobility:  
*Disaggregating Origin-Destination Matrices using Time-Progressive Graphs for Agent-Based Traffic Simulations*

My thesis proposes a novel algorithm to generate activity schedules. To prove the concept, I applied it to a large dataset from the city of Aachen. Coping with the computational requirements needed multiple optimizations (see projects).

Published abridged version:  
[doi.org/10.1016/j.procs.2022.03.072](https://doi.org/10.1016/j.procs.2022.03.072)

### Abitur

📅 2015

#### Max-Planck Gymnasium Saarlouis

Overall mark 2.1

- Computer science as main subject from 8th grade onwards
- Working group Artificial Intelligence
- Final exams in mathematics, computer science, French, German, history

### French Primary School

#### Institut de la Providence

## Blockchain for Education

### Fraunhofer FIT Cooperation Systems

This concept proposes a new file format for educational certificates. Their validity can be checked by a central server using blockchain. I contributed a desktop client to view, check and manage the certificates. The included HTML code had to be made resizable inside an iframe sandbox. Upon validation, a generated QR Code had to be injected into the certificate display.

## Open Mobility Platform

### Fraunhofer FIT Intelligent Mobility

The platform is used for the development, validation and documentation of protocols. The application goal was to merge the interfaces of different public transport providers. The documentation is bound to elements to achieve synchronicity with the schema. The use of the Yjs library enabled conflict-free live collaborations. My tasks were in frontend development including state management.

 [github.com/FIT-Mobility/interaction-protocol-suite](https://github.com/FIT-Mobility/interaction-protocol-suite)

## Disaggregating Origin-Destination Matrices

### Bachelor Thesis

I applied the algorithm from my bachelor thesis to a data set from Aachen. Java was initially chosen to comply with the SDK of the traffic simulation MATSim. The search space was an undirected graph with around 170.000 nodes. To cope with memory issues, I replaced objects with primitive datatypes. The poor editability of this code led to an implementation in Rust (see link).

 [github.com/LucasForster/day-plans](https://github.com/LucasForster/day-plans)

## Board Game AI

### Bachelor Course

The objective was to develop an AI that plays a highly modified version of Reversi. Over the course of a full semester, we competed in teams of four developers. I took care of performance optimizations as well as team organization and the repository.

## Microcontroller Operating System

### Bachelor Course

In a team of two, we developed an operating system on a microcontroller from scratch. It manages both dynamic as well as external memory. In the I/O area, we have implemented analog-digital converters as well as RFID communication.

## LANGUAGES



### German

First language



### English

Fluent, daily



### French – DALF C1 (2014)

Grew up bilingual

## ADDITIONAL SKILLS



### Git

Daily usage, including hosted features such as issues and pull requests.



### CI and CD

Continuous integration by running builds and tests, e.g. using GitHub workflows. Deployment typically using provider integrations such as from Netlify or Heroku.



### L<sup>A</sup>T<sub>E</sub>X Typesetting System

Countless documents (since schooldays), among them this CV:  
 [github.com/LucasForster/cv](https://github.com/LucasForster/cv)

