

# Valentin Hartmann

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## Education

### TU Berlin/IntCDC Stuttgart

Doctoral Student/Research Associate - Advisor Prof. Marc Toussaint

Stuttgart/Berlin (DE)

10/19 – ongoing

- Research focus: Task and Motion Planning for Architecture
- Research topics include: Path planning, optimization in planning and control, multi-agent systems

### ETH Zürich

Mechanical Engineering MSc - GPA 5.73/6

Zürich (CH)

09/16 – 02/19

- Focus on Robotics, Systems and Control - Coursework included: Mathematical Optimization, System Identification, Probabilistic Artificial Intelligence, Autonomous Mobile Robots, Game Theory and Control, Stochastic Systems, Advanced Topics in Control
- Semester Thesis: *Implementation of a High Performance Integration Scheme for Numerical Optimal Control Applications* - Developed and benchmarked an algorithm for numerical integration in C++. Contributed it to Boost Odeint - Grade: 5.75/6
- Masters Thesis: *A Constant-Complexity Approximation for the Recursive Bayesian Estimation of Closed-Skew Normal Distributions* - Moving horizon (optimal) state estimation for skewed noise distributions. Demonstrated theoretical guarantees. - Grade: 5.75/6

### ETH Zürich

Mechanical Engineering BSc - GPA 4.88/6

Zürich (CH)

09/13 – 08/16

- Focus on Mechatronics - Coursework included: Machine Learning, System Modeling, Signals and Systems, Statistics
- Bachelor's Thesis: *Inductance Based Stiffness Sensing Catheter* - Simulation, design, iteration, fabrication, and prototyping. Additionally developed libraries in C/C++ for communication with sensors that were used in my and other theses - Grade: 6/6

## Work Experience

### BCG Gamma

Visiting Data Scientist

Munich (DE)

04/19 – 08/19

### Verity Studios

Trajectory Generation Intern - Software Development

Zürich (CH)

03/18 – 08/18

- Developed collision free transition algorithms for a large number of drones as a part of the choreography generation tools
- Choreographed drone swarms of various sizes for internal customer demos and public-facing events (e.g. Drake, Starlight-Express)

### Amazon Robotics

Robotics Intern – International Launch Performance

Berlin (DE)

09/17 – 02/18

- Generated a daily email report with insightful visualizations that is currently used to identify problematic areas of the robotic field and deployed it to all warehouses in Europe which lead to an up to 30% reduction of robot breakdowns
- Analyzed and visualized complex data sets pertaining to mobile robot performance and field errors for remediation of high-severity incidents
- Developed hardware and software solutions for human performance estimation and prediction

### ETH Zürich - Computational Science and Engineering Laboratory

Research Assistant

Zürich (CH)

02/17 – 08/17

- Analyzed and predicted chaotic processes by examination of learned representations with recurrent neural networks

### ETH Zürich

Teaching Assistant

Zürich (CH)

09/14 – 12/16

- Held TA positions in Kinematics and Statics, Mechanics of Materials, Dynamics, and Biomechanics I multiple times
- Prepared and held exercise sessions for up to 90 undergraduate mechanical engineering students per lesson
- Created the midterm exams in a team of two for the Kinematics and Statics course with over 800 enrolled students

## Publications

Robust Task and Motion Planning for Long-Horizon Architectural Construction Planning

(to appear) IROS20

Valentin N. Hartmann, Ozgur S. Oguz, Danny Driess, Marc Toussaint, Achim Menges

## IT Skills

**Languages:** Proficient in C++, C, Matlab, Python, working knowledge of Bash, Mathematica, SQL

**IT:** Proficient in Tableau, Windows, Unix, OS X, Git, good knowledge of Yalmip, MOSEK

## Other Projects

### Receipt Scanning for Refrigerator Management

Hackzurich 2016

Zürich (CH)

09/16

- Task of the team: Developed a mobile app to keep track of stored food in households from scratch over a period of 40 hours
- My task: Implemented the preprocessing of camera images for improved character recognition performance with Python, using Tesseract and Google Cloud Computing

### Simulation of the Boarding Process in an Airplane

Zürich (CH)

02/15 – ongoing

- Analyzed turn-around times for various airlines and airplane types
- Implemented, simulated, and compared various boarding strategies with C++, visualized the processes with Processing

## Languages

**German:** Native speaker

**English:** Fluent (CEFR Level C2)

**French:** Intermediate knowledge