

# Curriculum Vitae

## Prof. Dr., Fürnstahl, Philipp

### PERSONAL INFORMATION

Date of birth: 08.08.1978

Nationality: Austria

Marital status: married

Researcher unique identifier: <https://orcid.org/0000-0001-6484-6206>

Google Scholar: <https://scholar.google.ch/citations?user=nQ4B3BgAAAAJ>

Contacts: +41 44 510 73 60, philipp.fuernstahl@balgrist.ch

URL: <https://rocs.balgrist.ch>

### · CURRENT POSITION(S)

- 2020 – now     **Assistant Professor (tenure track)** in Orthopedic Computer Science  
Double Professorship in the Faculty of Medicine and the Faculty of Sciences,  
University of Zurich / Zurich, Switzerland
- 2012 – now     **Head of ROCS (Research in Orthopedic Computer Science)**  
University Hospital Balgrist, University of Zurich / Zurich, Switzerland  
*- formerly Balgrist CARD research group*

### · PREVIOUS POSITIONS

- 2014 – 2018    **Co-founder and managing director**  
Balgrist CARD Inc., Zurich, Switzerland  
*- A successful exit was achieved and the company was acquired by Medacta International Inc., a global orthopedic implant manufacturer.*
- 2010 – 2012    **Senior software developer and architect / Project manager**  
Siemens Schweiz AG / ATOS Schweiz AG, Zurich, Switzerland
- 2001 – 2006    **Co-founder and managing director**  
DSTANCE Software, Graz, Austria  
*- a software engineering company for educational applications, UID: ATU55797203*

### · EDUCATION

- 2018            **Postdoctoral lecture qualification (habilitation)**  
*- Faculty of Medicine, University of Zurich / Zurich Switzerland*  
*- Topic: “Computer-assisted preoperative planning and execution of corrective osteotomies in post-traumatic malunions”*
- 2010            **PhD (Doctor of Sciences ETH Zurich)**  
*- Computer Vision Laboratory, Federal Institute of Technology (ETH) Zurich / Zurich, Switzerland*  
*- PhD Supervisor: Prof. Dr. Gábor Székely*  
*- Topic: “Computer-assisted 3D planning for orthopedic surgery”*
- 2005            **Master of Sciences (graduated with distinction)**  
*- Technical Mathematics and Information Processing, Technical University Graz / Graz, Austria*  
*- Topic: “Global mesh partitioning for surgical planning”*

1996            **Abitur/Matura**  
- *Bundesrealgymnasium Carnerigasse, Graz, Austria*

·    **TEACHING ACTIVITIES**

2020 – now      Sessions **Computer Aided Surgery** (fall) and **Modern Instruments for Treatment Quality Improvement** (spring) in the track medicine & technology of the electives study in the medical curriculum  
Faculty of Medicine / University of Zurich/ Zurich, Switzerland

2018 – 2019      Session **Patient Specific Surgery** in the track medicine & technology of the electives study in the medical curriculum  
Faculty of Medicine / University of Zurich/ Zurich, Switzerland

·    **INSTITUTIONAL RESPONSIBILITIES**

2021 – now      **Member of the Appointment Committee PD Dr. Anna Lindholm**, University of Zurich, Faculty of Science / Zurich, Switzerland

2021 – now      **Member of the Teaching Commission**, University of Zurich, Faculty of Medicine / Zurich, Switzerland

2021 – now      **Member of the Scientific Advisory Board**, University Medicine Zurich, Zurich, Switzerland

2021 - now      **Innovative university teaching project, TEACHSURGERY: Augmented Reality als Lehrmittel für die Chirurgie**", University of Zurich / Zurich, Switzerland

2020 – now      **Faculty member, University of Zurich**, Faculty of Medicine / Zurich, Switzerland

2020 – now      **Faculty member, University of Zurich**, Faculty of Science / Zurich, Switzerland

2020 – now      **Scientific coordinator**, University Medicine Zurich flagship project SURGENT

2012 – now      **Head of the Computer Aided Surgery Lab**, University Hospital Balgrist / University of Zurich / Zurich, Switzerland

·    **ORGANISATION OF SCIENTIFIC MEETINGS**

2019, 2021      **Medical Augmented Reality Summer School**. Lecturer and co-organizer together with Technical University Munich and Johns Hopkins University / University Hospital Balgrist / Zurich, Switzerland.

2016 - 2018      **Four workshops on CAI around the hand, forearm, knee, and spine with CME Accreditation of Swiss Orthopedics**. Organizer and lecturer / University Hospital Balgrist / Zurich, Switzerland.

·    **AWARDS**

2021            Best Application Paper Gold Award for "Augmented reality based surgical navigation of the periacetabular osteotomy of Ganz - a pilot cadaveric study" (Hoch A, Liebmann F, Carrillo F, Farshad M, Rahm S, Zingg P.O, Fürnstahl P.). Medical Robotics Week 2021, Switzerland.

2020            Best National Paper e-Poster for "Augmented Reality Guided Periacetabular Osteotomy – Proof Of Concept" (Kiarostami P, Dennler C, Roner S, Sutter R, Fürnstahl P, Farshad M, Rahm S, Zingg P). Virtual EFORT Congress, Switzerland.

· **PUBLIC SCIENTIFIC ENGAGEMENT**

- 2020 Schweizer Digitaltage, Webinar "Wie verändert Digitalisierung die Präzisionsmedizin?", 50 participants, 02.11.2020.
- 2020 Instructional Course "Computer aided orthopaedic surgery, from AI to robotics". SGOT: Swiss annual Congress of Orthopaedics and Traumatology, e-Congress, Switzerland.
- 2019 Joint Workshop in Medicine, University of Zurich and Kyoto University, Zurich.
- 2019 Scientifica, 6 Workshops "Precise surgery with augmented reality lenses", 25 participants per workshop, 31.08.-01.09.2019, University of Zurich, Switzerland.
- 2019 Complex Spine Symposium „Spinal Deformity“, Interactive Sawbone Session, 55 participants, 23.05.2019, Balgrist University Hospital, Zurich, Switzerland.
- 2019 CARD Basic Workshop "MyOsteotomy around the knee" on 3D-planned corrective osteotomies performed with the MyOsteotomy PSI system in knee surgery, CME accreditation of Swiss Orthopaedics, 17 participants, 18.01.2019, Zurich, Switzerland.
- 2018 Schweizer Digitaltage, Workshop "Patientenspezifische Operationsplanung & chirurgische Navigation", 25 participants, 25.10.2018, Balgrist University Hospital, Zurich, Switzerland.
- 2018 CARD Workshop "Upper extremities" on 3D-planned corrective osteotomies performed with the MyOsteotomy PSI system in hand, forearm and shoulder surgery, CME accreditation of Swiss Orthopedics and Swiss Hand Surgery, 4 participants, 09.11.2018, Zurich Switzerland.
- 2017 Fürnstahl P, 3D preoperative planning and patient-specific instrumentation for complex osteotomies. 19. course on analysis and correction of leg deformities, Ranft bei Luzern, Switzerland.
- 2017 CARD Workshop on 3D-planned corrective osteotomies performed with the MyOsteotomy PSI system in hand and elbow surgery, CME accreditation of Swiss Orthopedics and Swiss Hand Surgery, 20 participants, 24.11.2017, Zurich, Switzerland.
- 2016 CARD Workshop on 3D planning and application of corrective osteotomies of the forearm with patient-specific guides, CME accreditation of Swiss Orthopedics and Swiss Hand Surgery, 33 participants, 7.-8.10.2016, Zurich, Switzerland.

· **REVIEWING ACTIVITIES**

- 2021 – now BMC Muskuloskeletal Disorders
- 2021 – now The International Journal of Medical Robotics and Computer Assisted Surgery
- 2021 - now Scientific Reports - Nature
- 2020 - now Automatisierungstechnik
- 2019 - now MICCAI
- 2019 - now Journal of Biomedical and Health Informatics, IEEE
- 2014 - now Medical Image Analysis Journal, Elsevier
- 2014 - now Journal of Computer Assisted Radiology and Surgery, Springer

· **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

- 2020 – now MICCAI Society (Medical Image Computing and Computer-Assisted Interventions)
- 2018 – now Swiss Society of Orthopedics and Traumatology / Associate Member

· **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

### **3 Postdoctoral fellows (computer scientists)**

- *University Hospital Balgrist / University of Zurich: Dr. Lorenzo Pitto (2021 – now), Dr. Hooman Esfandiari (2020-now), Dr. Fabio Carrillo (2019-now)*

### **11 Technical PhD students (4 graduated, 7 ongoing)**

- *Institute for Computational Science / Faculty of Science; Aidana Massalimova (2021-now), Sascha Jecklin (2020-now) University of Zurich / Zurich, Switzerland*
- *Department of Informatics: Jonas Hein (2021-now) Swiss Federal Institute of Technology / Zurich, Switzerland*
- *Department of Health Sciences and Technology: Joëlle Ackermann (2018-now), Florentin Liebmann (2017-now), Marco Paul von Atzigen (2018-now), Tabitha Roth (2019-now), Fabio Carrillo (2019) Swiss Federal Institute of Technology / Zurich, Switzerland*
- *Department of Electrical Engineering: Fabien Pean (2021), Firat Özdemir (2020) Swiss Federal Institute of Technology / Zurich, Switzerland*

### **7 Medical dissertations (6 graduated, 1 ongoing)**

- *Medical Faculty: David Leuzinger (2019-now), Fabio Müller (2021), Christoph Zindel (2021), Marco Burkhard (2018), Andreas Hingsammer (2015), Claudio Letta (2014), Faustine Vallon (2013) University of Zurich / Zurich, Switzerland*

### **5 Technical master students (3 graduated, 3 ongoing)**

- *Department of Informatics: Susanna Pesonen (2021), Carla Jancik (2021), Matthias Wieland (2021), Jonas Hein (2020), Aman Aman (2019), Florentin Liebmann (2018) University of Zurich / Zurich Switzerland*
- *Department of Health Sciences and Technology: Bettina Gübeli (2017)*
- *Department of Electrical Engineering: Goran Jevdjic (2013) Swiss Federal Institute of Technology / Zurich, Switzerland*

### **12 Medical master students (7 graduated; 5 ongoing)**

- *Medical faculty: Dietmar Luchmann (2021-now), Niels Buis (2020-now), Geraldine Grossenbacher (2019-now), Giulia Ceschi (2019-now), Danijel Novina (2019-now), Sandro Müller (2020), Daniel Abegg (2020), Yannik Da Silva (2018), David Leuzinger (2018), Mario Strähl (2018), Yannik Stutz (2018), Simon Suter (2019) University of Zurich / Zurich, Switzerland*

### **2 Bachelor thesis (2 graduated)**

- *Institute of Data Science: Beda Rutishauser, Dominique Tschumi (2019) University of Applied Sciences Northwestern Switzerland / Windisch, Switzerland*
- *Department of Informatics: Fabian Schneider (2017) Swiss Federal Institute of Technology / Zurich, Switzerland*

### **7 Semester Projects (7 graduated)**

- *ZHAW School of Engineering: Steven Walker (2020) Zurich, Switzerland*
- *Swiss Federal Institute of Technology: Claudia Häberling (2018), Kevin Thandiackal (2016), Qixuan Zhang (2016), Celestine Dünner (2014), Salomon Diether (2013), Diego Dällenbach (2013) Zurich, Switzerland*

### **· PhD CO-EXAMINER / COMMITTEE MEMBER**

- 20.01.2021 *Sebastiano Carprara, Swiss Federal Institute of Technology / Zurich, Switzerland*
- 12.06.2020 *Guodong Zeng, University of Bern / Switzerland*

· **INVITED KEYNOTE TALKS**

- 08/2020 "How computer science is transforming orthopedics: From anatomical modeling to surgeon enhancing technologies" at the EXCITE Symposium in Zurich, Switzerland.
- 08/2020 Instructional Course "Computer aided orthopaedic surgery, from AI to robotics" at the SGOT 2020: Swiss annual Congress of Orthopaedics and Traumatology, e-Congress, Switzerland.
- 08/2019 "Computer-assisted preoperative planning and surgical navigation of orthopedic surgeries" at the Medical Augmented Reality summer school in Zurich, Switzerland (organized by Technical University Munich, Johns Hopkins University and University of Zurich).
- 06/2018 "What are the indications of three-dimensional corrective osteotomies?" at the SGOT 2018: Swiss Annual Congress of Orthopedics and Traumatology, Montreux, Switzerland.
- 2013 / 2014 "Advantages and pitfalls in additive manufacturing for orthopedic surgery" at the Rapid.Tech 3D Congress - International hub for additive manufacturing, Erlangen, Germany.

· **GRANTS**

- 2021 – 2023 **European Commission, Horizon 2020: 719'523 (sub-project), 2'990'898 EUR (total)** «FAROS: Functionally Accurate Robotic Surgery.» One of four principal investigators.
- 2021 – 2022 **University of Zurich: 36 kCHF**  
Competitive teaching grant for the project «TEACHSURGERY: Augmented Reality als Lehrmittel für die Chirurgie». Principal investigator.
- 2020 – 2023 **University of Zurich: 420 kCHF**  
Start-up fund for the PI's Professorship in Orthopedic Computer Science (equipment and staff).
- 2020 – 2024 **Monique Dornonville de la Cour Foundation: 280 kCHF**  
«Context-aware surgical navigation based on sensor fusion and augmented reality.»  
Principal investigator.
- 2018 - 2019 **Balgrist Foundation: 39 kCHF**  
«A semi-automatic video labelling tool for machine learning from intraoperative data.» Principal investigator.
- 2018 – 2021 **Hochschulmedizin Zürich Flagship Project: 125 kCHF (sub-project), 1 Mio. CHF (total)** «SURGENT – Surgeon enhancing technologies.» One of eight Principal investigators.
- 2018 - 2022 **Swiss National Science Foundation (SNF-320030): 620 kCHF**  
«3D-LEDECO: Simulation-based surgical planning for optimized leg deformity correction under consideration of weight-bearing and joint load.» Principal investigator.
- 2018 – 2021 **Promedica Foundation: 200 kCHF**  
«A new treatment approach for severe Legg–Calvé–Perthes Deformity (LCPD) based on computer simulation and surgical navigation.» Principal investigator.
- 2017 – 2018 **Balgrist Foundation: 120 kCHF**  
«Novel patient-specific guides for extending the card field of application in hand surgery.» Principal investigator.
- 2017 – 2018 **Balgrist Foundation: 85 kCHF**  
«Integration von Weichteilstrukturen in die CARD-Operationsplanungsmethode.»  
Principal investigator.
- 2017 – 2018 **Deutsche Arthrosestiftung: 23 kCHF**

- «3D preoperative osteotomy planning for improving femoral head resection: A feasibility study.» Principal investigator.
- 2016 – 2017 **Commision for Technology and Innovation CTI (18999.1PFL-LS): 250 kCHF**  
«A statistical inference model of bone anatomy for the corrective osteotomy planning of malunited forearm bones.» Main business partner.
- 2016 – 2019 **Swiss National Science Foundation (SNF-325230L): 312 kCHF**  
«Analysis and simulation of the distal forearm stability during pro-supination for improved surgical planning.»  
D-A-CH funding with Austria (additional 276 kCHF provided by the FWF). Principal investigator.
- 2015 – 2016 **Promedica Foundation: 130 kCHF**  
«Automated preoperative planning for the improved treatment of patients with bone malunion.» Principal investigator.
- 2014 – 2018 **Canton of Zurich, Förderung der hochspezialisierten Medizin: 2.2 Mio. CHF**  
«Verbesserung von Patientensicherheit und Ergebnisqualität durch computergestützte, patienten-spezifische 3D Planung, Simulation und Durchführung von Operationen.» Principal investigator.
- 2013 – 2016 **Balgrist Foundation: 210 kCHF**  
«Computergestützte 3D Planung von Schulterhemiprothesen bei komplexen proximalen Humerusfrakturen unter Einbezug der kontralateralen Seite.» Principal investigator.