

Simon Schleicher

Assistant Professor, College of Environmental Design, UC Berkeley

Short Bio

Simon Schleicher is an architectural designer, researcher, and educator from Germany who works in the threshold of architecture, engineering, and biology. In his research on bio-inspired compliant mechanisms, Simon is searching for a promising alternative to the still persisting paradigm of rigid-body mechanics and has found inspiration in flexible plant movements. He aims to transfer bending and folding mechanisms found in plant movements to elastic systems in architecture. By using modern computational modeling and simulation techniques, he can reveal the plants' compliant mechanisms and integrate them into bio-inspired flexible structures. In various case studies, he demonstrates the transfer process in more detail and shows how bio-inspired mechanisms can be used, for example, to shade double curved facades.

Previously Simon was project manager for the first ICD/ITKE Research Pavilion 2010, which won the DETAIL prize and was nominated for the Mies van der Rohe Award. With his work, Simon has won further awards including the Gips-Schüle-Forschungspreis, the International Bionic-Award, the Ralph Adam Cram Award, the Imre Halasz Thesis Prize, the British Institution Award, and the Pininfarina-Förderpreis. During his study, Simon was recipient of a Merit-Based Full-Tuition Scholarship at MIT and received grants from the DAAD and from the prestigious German National Academic Foundation (Studienstiftung des Deutschen Volkes).

Education

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| 2009 - 09/2015
<i>(viva 07/27/2015)</i> | Dr.-Ing. (Doctor of Engineering) (grade: very good with distinction)
University of Stuttgart, Baden-Wuerttemberg, Germany
Institute of Building Structures and Structural Design (ITKE)
topic: "Bio-inspired Compliant Mechanisms for Architectural Design"
advisors: Prof. Jan Knippers and Prof. Thomas Speck |
| 2006 - 2009 | Master of Architecture
Massachusetts Institute of Technology, Cambridge, MA, USA GPA: 5.0/5.0
thesis: "Adaptive Toldo Systems" |
| 2002 - 2006 | Pre-Diploma Examination in Architecture and Urban Planning
University of Stuttgart, Baden-Wuerttemberg, Germany GPA: 5.0/5.0
focus: Lightweight Structures, Bio-inspired Design, Building Construction |
| 1992 - 2001 | University-Entrance Diploma (Abitur)
Gymnasium Ottobrunn, Munich, Germany
thesis: "Shape Optimization following the Design Rules of Trees and Bones" |

Academic Experience

08/2014 - present	Assistant Professor , University of California, Berkeley
05/2009 - 02/2014	Research Associate , University of Stuttgart, Stuttgart, Germany Institute of Building Structures and Structural Design (ITKE)
05/2009 - 02/2014	Graduate Thesis Advisor (B/O Prof. Knippers), University of Stuttgart Institute of Building Structures and Structural Design (ITKE)
10/2013 - 03/2014	Visiting Lecturer , University of Innsbruck, Innsbruck, Austria Institut für Konstruktion und Gestaltung (KOGÉ)
01/2004 - 12/2006	Graduate Research Assistant , University of Stuttgart, Stuttgart, Germany Institute of Building Structures (IBK 2)

Professional Experience

09/2013 - 08/2014	Principal and Founder , seamwork® - Transdisciplinary Design
09/2009 - 07/2010	Project Manager , ICD/ITKE Research Pavilion 2010, Stuttgart, Germany
07/2004 - 09/2004	Designer , Auer+Weber Architects, Munich, Germany
02/2003 - 04/2003	Designer , Werner Sobek Engineers, Stuttgart, Germany

Teaching (UC Berkeley and University of Stuttgart)

Fall 2017/18	STUDIO ONE - Bio-inspired Design and Fabrication (in preparation)
Fall 2016/17	STUDIO ONE - Bio-inspired Design and Fabrication
Fall 2016	ARCH 259 - Form-finding and Panelization II
Spring 2016	ARCH 259 - Variable Property Design and Fabrication II ARCH 259 - Form-finding and Panelization I
Fall 2015	ARCH 203 - Integrated Design Studio ARCH 259 - Variable Property Design and Fabrication I
Spring 2015	ARCH 259 - Bending and Folding Structures II ARCH 299 - Individual Research for Graduate Student
Fall 2014	ARCH 259 - Bending and Folding Structures I
Spring 2013	Bending-(re)active Plates
Spring 2012	Kinematical Folding II
Fall 2011	Kinematical Folding I
Spring 2010	Material Systems II, Bend.IT
Fall 2009	Material Systems I, Bend.IT

Invited Lectures and Conference Presentations (selection)

- 11/17/2016 **Design Innovation from Nature: Bio-inspired Flexible Structures**
Myers School of Art, University of Akron, Akron, USA.
- 10/27/2016 **Bending-active Plates: Form-finding and Form-conversion**
ACADIA Conference 2016, Ann Arbor, Michigan, USA.
- 09/26/2016 **Bio-inspired Flexible Structures**
Structural Engineering, Mechanics and Materials (SEMM) Program
Department of Civil and Environmental Engineering, University of California,
Berkeley, USA.
- 09/12/2016 **Bending-active Plates: Form and Structure**
AAG Conference 2016, ETH Zürich, Zürich, Switzerland.
- 04/30/2016 **Recent work on flexible composite structures**
Kreysler & Associates, American Canyon, USA.
- 04/29/2016 **Recent work on bio-inspired design and fabrication**
Woods Bagot, San Francisco, USA.
- 04/18/2016 **Biomimetics in architecture**
IB 32 - Bioinspired Design, University of California, Berkeley, USA.
- 04/08/2016 **Recent work on bio-inspired design and fabrication**
Tyler School of Art, Temple University, Philadelphia, USA.
- 09/30/2015 **Form-finding and design potentials of bending-active plate structures**
Design Modelling Symposium, CITA, Copenhagen, Denmark.
- 08/28/2015 **Recent work on compliant mechanisms for architectural design**
HOK, San Francisco, USA.
- 07/27/2015 **Bio-inspired compliant mechanisms for architectural design**
Doctoral viva, University of Stuttgart, Stuttgart, Germany.
- 04/08/2015 **A holistic approach to the design of bio-inspired, flexible structures**
MRS Spring Meeting, San Francisco, USA.
- 03/06/2015 **Flexible structures and bio-inspired design**
Berkeley Circus 2015, University of California, Berkeley, USA.
- 03/03/2015 **Recent work on bending-active structures**
Cornell University, College of Architecture, Art, and Planning, Ithaca, USA.

- 02/13/2015 **Designing with flexibility & bending-active structures**
University of Southern California (USC), Los Angeles USA.
- 02/26/2014 **Bending-active structures and bio-inspired compliant mechanisms**
University of California, Berkeley, USA.
- 02/20/2014 **Bio-inspired mechanisms - Designing with flexibility**
Institute for advanced architecture of Catalonia, IAAC, Barcelona, Spain.
- 02/14/2014 **Bio-inspired structures and mechanisms**
Ball State University, College of Architecture and Planning, Muncie, USA.
- 10/29/2013 **The power of flexibility**
Designing elastic structures and compliant mechanisms
Royal Danish Academy of Fine Arts, School of Architecture, Centre for Information Technology and Architecture (CITA), Copenhagen, Denmark.
- 07/08/2013 **Transferring plant movements to elastic systems in architecture**
ALIVE 2013 - International Symposium on Adaptive Architecture, ETH, CH.
- 03/21/2012 **The potential of novel design and fabrication processes for the transfer of plant kinematics into technical systems**
International School and Conference on Biological Material Science, Bio-Inspired Materials, DGM, Potsdam, Germany.
- 10/07/2011 **Bio-inspired kinematics and bending-active structures**
3M futureLAB by UCLA, AdBK Munich, Germany.
- 03/07/2011 **Adaptive façade shading systems inspired by natural elastic kinematics**
International Conference on Adaptive Architecture, London, UK.
- 06/28/2011 **Abstraction of bio-inspired curved-line folding patterns for elastic foils and membranes in architecture**
Design and Nature V, Pisa, Italy.

Research (initiatives at UC Berkeley since 2014)

- Fall 2016 - ongoing **Design Innovation from Nature**
team: S. Schleicher (PI), R. Fearing (Co-PI), R. Full
- Fall 2014 - ongoing **Bio-inspired Structures and Kinetic Systems**
University of California, Berkeley role: PI
- Fall 2014 - ongoing **Advanced Flatbed Manufacturing and Bending-active Structures**
University of California, Berkeley role: PI
- Spring 2015 - ongoing **3-D Printing of Compliant Mechanisms and Flexural Fixtures**
University of California, Berkeley role: PI
- Spring 2009 - Fall 2014 **Bio-inspired Compliant Mechanisms for Architectural Design**

University of Stuttgart, Stuttgart role: PI
 Fall 2009 - Spring 2013 **Flexible Surface Structures on the basis of Biomimetic Principles**
 University of Stuttgart, Department of Architecture and Urban Planning
 role: collaborating researcher
 Fall 2009 - Spring 2010 **ICD/ITKE Research Pavilion 2010**
 University of Stuttgart, Department of Architecture and Urban Planning
 role: project manager

Received Grants and Funded Research

2016 - 2018 **IIS Interdisciplinary Faculty Program, UC Berkeley**
 Title: Design Innovation from Nature
 team: S. Schleicher (PI), R. Full, R. Fearing
 role: PI grant: \$ 60.000
 Spring 2016 **Regents' Junior Faculty Fellowship at UC Berkeley**
 3D Printing Distant Lamina Shells grant: \$ 5,000
 2009 - 2013 **Federal Ministry of Education and Research (BMBF), Germany**
 Title: Flexible Surface Structures on the basis of Biomimetic Principles
 role: collaborating researcher grant: 1.237.587 €

Research Proposals Submitted

04/2016 **Design Innovation from Nature**
 IIS Interdisciplinary Faculty Program
 team: S. Schleicher (PI), R. Full, R. Fearing
 status: selected for funding
 09/2015 **AFOSR MURI Topic 11: 4-D Electromagnetic Origami**
 ROBALC: Reconfigurable Origami Based Artificial Liquid Crystal
 team: R. Fearing (PI), K. Sarabandi, A. Javey, J. Bachrach, S. Schleicher
 status: not funded
 04/2015 **Regents's Junior Faculty Fellowship at UC Berkeley**
 New Approach to Design and Fabrication of Bending-active Plate Structures
 status: not funded
 02/2015 **Förderlinie: Innovationsfonds Forschung 2015**
 Morphological diversity of functional traps in the venus flytrap
 team: S. Poppinga (PI), T. Speck (Co-PI), S. Schleicher (Co-PI)
 status: not funded
 11/2014 **ARO MURI Topic 1: Emulating the Principles of Impulsive Biological Force Generation**
 Bio-Inspired Multi-Scale Impulsive Energy Control (BIMSIEC)
 team: R. Fearing (PI), R. Full (Co-PI), S. Schleicher (Co-PI), A. Javey, M. Crommie
 status: not funded

Fellowships and awards

10/2013	Gips-Schüle-Forschungspreis Gips-Schüle-Stiftung and Regierungspräsidium Stuttgart, Germany "The award recognizes and supports outstanding achievements and applied research in the area of human & technology."
10/2012	International Bionic-Award Schauenburg-Foundation and VDI (Association of German Engineers)
03/2011	Techtextil and Avantex Innovation Award Messe Frankfurt Exhibition GmbH In recognition of the Flectofin® - An Adaptive Facade Shading System
01/2011	DETAIL Prize , Category "University", ICD/ITKE Research Pavilion 2010
06/2011	Shortlisted for EU Prize for Contemporary Architecture Mies van der Rohe Award Fundació Mies van der Rohe
03/2011	Shortlisted for Deutscher Holzbaupreis , ICD/ITKE Research Pavilion 2010 Bund Deutscher Zimmermeister and DBU (Deutsche Bundesstiftung Umwelt)
12/2010	Stuttgarter Leichtbaupreis , ICD/ITKE Research Pavilion 2010 Verein zur Förderung des Leichtbaus e.V.
09/2010	Ralph Adam Cram Award Department of Architecture, MIT
03/2010 - 2012	PhD-Scholarship German National Academic Foundation, Studienstiftung des Deutschen Volkes
06/2009	Imre Harasz Thesis Prize Department of Architecture, MIT "In recognition of academic excellence as represented in a Master of Architecture thesis in which the design recognizes the expanding responsibility of architecture."
09/2006 - 2009	Departmental Scholarship Award and Partial-Tuition Scholarship Department of Architecture, MIT
09/2007 - 2008	Merit-Based Full-Tuition Scholarship Department of Architecture, MIT
05/2008	Aga Khan Travel Grant Aga Khan Program for Islamic Architecture (AKPIA), MIT
02/2007 - 2008	DAAD Scholarship German Academic Exchange Service.
07/2007	British Institution Award (w/ Hickl S., Quisinsky T.) Royal Academy of Arts, London
07/2007	Shortlisted for Newcomer-Price (w/ Hickl S., Quisinsky T.) Royal Academy of Arts, London
01/2007	Smart Geometry Champion Smart Geometry Workshop, New York
03/2006 - 2007	SUTOR-Scholarship German National Academic Foundation, Studienstiftung des Deutschen Volkes
07/2006	Pininfarina Student Award , Category: Building Design (w/Hickl S., Quisinsky T.)
04/2005 - 2009	Scholarship of the Studienstiftung des Deutschen Volkes Awarded to the top 0.7% of German students.
07/2004	Award for best Pre-Diploma thesis at the University of Stuttgart