

**LARS JUNGHANS, PhD**  
**CURRICULUM VITAE**

**Lars Junghans (PhD)**

E-mail: Junghans@umich.edu

**EDUCATION**

1/2006 – 11/2006

**University of California Berkeley, USA**  
Post-doctoral studies

8/2002 – 1/2005

**ETH Zürich, Switzerland**  
**Doctor of Science**  
Thesis: "Optimal Facade Technologies in Tropical and Subtropical  
Climates"  
Advisors: Prof. K. Daniels, Prof. D. Eberle and Prof. R. Hastings

1995-2001

**Technical University Braunschweig, Germany**  
**Diploma in Architecture**

**ACADEMIC APPOINTMENTS**

Sept. 2010 – current

**University of Michigan**  
**Taubman College of Architecture**

Field: Building Physics, Sustainable Building Design, Mechanical  
Building Systems

Sept. 2008 – Aug 2010

**University of Liechtenstein**  
Lecturer

**PROFESSIONAL EXPERIENCE**

12/2006 – 8/2010

**TeamGMI, Engineering office, Vaduz, Liechtenstein**  
Project manager for building simulation and energy system  
development

**Baumschlager & Eberle Architects**  
- Consulting on energy efficient architecture and energy concepts  
- Software development

8/2001 – 8/2002

**AEU Architecture, Energy and Environment Ltd., Wallisellen,  
Switzerland (Principal: Prof. Robert Hastings, dipl. Arch.)**  
- Research on low energy housing for the IEA (International Energy  
Agency)

1997 – 2001

Research during architecture study in Germany

1992 – 1995

Apprenticeship as a carpenter

## REGISTRATION and PROFESSIONAL SOCIETIES

2010 – current ASHRAE Association of Heating Refrigeration and Air Conditioning of America

## AWARDS

2015 Building 22/26 awarded with Energy Globe price of Vorarlberg 2015  
Gold Metal for Building 22/26 at German Design Award 2015  
Building 22/26 on the shortlist for nomination for Mies van der Rohe – Award 2015

## BOOK CHAPTERS

2015 BE Baumschlager Eberle 22/26, Book Chapter, Birkhauser Publisher, ISBN 978-3-0356-0387-3, Editor: F. Aicher, 5/2015

2014 Junghans L., “ Generic Optimization Algorithm for Building Energy demand Optimization”, Book Chapter in: “Post-Parametric Automation in Design and Construction”, Editor Thomas Spiegelhalter and Alfredo Andia, to be published in Archtech House, Inc. Norwood USA, London UK.

2007 Junghans L., "Shading and Glazing", chapter in *Plusminus 20°/40°Latitude, Sustainable Building Design in Tropical and Subtropical Regions*, Editor K. Daniels, Published by Axel Menges, Stuttgart DE

2005 Junghans L., Hastings, R., "Daylighting", chapter in *Sustainable Solar Housing*, Edited by Robert Hastings and Maria Wall, Published by Earthscan, London UK on behalf of the International Energy Agency IEA

Junghans L.,Hastings, R., “Daylighting in High Performance Residential Buildings”, *International Daylighting* issue 5 Sept.2002, Australia

Junghans L., "Thermal Chimneys", chapter in “Innovative designs for Warm Climates” from IEA SHC Task 28, Edited by R. Hyde and R. Hastings. Published by Earthscan, London UK on behalf of the International Energy Agency IEA

## PEER REVIEWED JOURNAL ARTICLES

2018 Junghans L., Tish D, Bruggman D, Thun G ,Velikov K,“Climate Measures: Experiments Toward Hyper-local Reverse Heat Flow Assemblies” ,Technology | Architecture + Design (TAD) : Vol.2 No.2 11/2018

2017 Junghans L., Widerin P., “Thermal comfort and indoor air quality of the “Concept 22/26”, a new high performance building standard”, *Energy and Buildings* 149 (2017) 114-122

Shan R.,Junghans L.,“Adaptive radiation optimization for building façade design”, *Building Simulation Journal*, (accepted paper, in press)

- 2016 Junghans L., Bae N., "Influence of the uncertainties of occupant behavior on computer-based optimization process", *Energy and Buildings* 116: 478-497
- 2015 Junghans L., Darde N., "Hybrid Single Objective Genetic Algorithm coupled with the Simulated Annealing Optimization Method for Building Optimization", *Energy and Buildings*, 86 651-662
- Velikov K., Thun G., O Malley M., Junghans L., "Computational and Physical Modeling for Multi-Cellular Pneumatic Envelope Assemblies", *International Journal of Architectural Computing* 13 (2):143-168
- 2014 Junghans L., "Economic and ecologic of Heat Pump Systems in Buildings with different Insulation Levels", *Renewable Energy*, 76 699-705
- Junghans L., "Economic Applicability Evaluation of Heat Pump Pump Systems in Buildings with different Insulation Levels", *ASHRAE Transactions* Vol. 120, Issue 2
- 2013 Junghans L., "Sequential Equi-Marginal Optimization Method for ranking strategies for Thermal Building Renovation", *Energy and Buildings*, 65 10-18

#### ACADEMIC AND PROFESSIONAL CONFERENCE PAPERS

- 2016 Walter Hugentobler, Willem Bruijn, Peter Widerin, Lars Junghans, (2016), "Do healthy buildings need technology?", *Proceedings of the Indoor Air Conference 2016*, Gent, Belgium, peer reviewed
- 2015 Junghans L., "Concept 2226, Simulation Methods", *Proceedings of the Building Simulation Conference IBPSA 2015*, Hyderabad, India, peer reviewed
- Junghans L., "Hybrid Optimization for Complex Façade Systems", *Proceedings of the Building Simulation Conference IBPSA 2015*, Hyderabad, India, peer reviewed
- Shan R., Junghans L., "Evolutionary Adaptive Radiation Principles used for Building Façade Optimization", *Proceedings of the Building Simulation Conference IBPSA 2015*, Hyderabad, India, peer reviewed
- Junghans L., "Concept 2226, a High Performance Office Building without Mechanical Heating, Cooling and Ventilation Devices", *Proceedings of the International Solar Energy Society Conference ISES 2015*, Daegu, South Korea, peer reviewed
- Junghans L., Sustainability and resiliency of the 22/26 Building in Lustenau. What can we learn for the future? *BAUZ Conference on Sustainable Buildings Proceedings 2/2015*, peer reviewed
- Slee B, Hyde R, Blair J, Junghans L, "The NSW Demountable classroom: A review of existing research and proposed methodology for future research", *Procedia of the 2014 Asia-Pacific Solar Research Conference*, Singapore, peer reviewed

- 2014 Junghans L., "Improved fast calculating building optimization processes using the genetic algorithm", *Energy Procedia* 2014 5, peer reviewed
- 2013 Junghans L., "Fast Calculating Multi-Parameter Building Optimization for Early Design Stages using the Climate Surface Calculation Method", Proceedings of CISBAT conference, Lausanne 2013, Switzerland, peer reviewed
- 2005 Junghans L., "Shading and Cooling Energy Demand in Office Buildings in Hot Climates", *Conference Proceedings: Neuntes Symposium Innovative Lichttechnik in Gebäuden*, Publisher OTTI Energiekolleg, Regensburg, DE, ISBN 3-934681 24-7, peer reviewed

#### **ACADEMIC AND PROFESSIONAL LECTURES OR PRESENTATIONS**

- 5/2019 „Measurement results of the Concept 22-26 “. Invited presentation at the Technical University of Berlin and the German Federal Department of Housing, Berlin , Germany
- 10/2018 „The Concept 22-26 for the humid climate of south Korea“. Invited presentation at the Korean Society of Architects, Busan, South Korea
- 9/2018 „The Concept 22-26 for the humid climate of south Korea“. Invited presentation at Yonsei University, Seoul, South Korea
- 3/2016 "Concept 22-26" Cornell University, Department of Architecture, Invited presentation
- 12/2015 "Concept 2226, a new High Performance Office Building without Mechanical Heating, Cooling and Ventilation Devices", Building Simulation Conference IBPSA 2015, Hyderabad, India, Presentation of research paper
- 12/2015 "Hybrid Optimization for Complex Façade Systems", Building Simulation Conference IBPSA 2015, Hyderabad, India, Presentation of research paper
- 11/2015 "Concept 2226, a new High Performance Office Building without Mechanical Heating, Cooling and Ventilation Devices", International Solar Energy Society Conference ISES 2015, Daegu, South Korea
- 5/2015 "Concept 2226, a new High Performance Office Building without Mechanical Heating, Cooling and Ventilation Devices", University of California Berkeley, USA
- 4/2015 "Concept 2226, a new High Performance Office Building without Mechanical Heating, Cooling and Ventilation Devices", University of New South Wales, Australia
- 4/2015 "Concept 2226, a new High Performance Office Building without Mechanical Heating, Cooling and Ventilation Devices", Sydney Technical University, Australia
- 2/2015 „BAUZ 2015 – Vienna Congress on Sustainable Buildings“ , Invited Key Speaker, Vienna, Austria

- 7/2014 "Economic and ecologic feasibility of heat pump systems in asian countries", ISES Conference Asia, Tokyo, Japan
- 7/2014 "Concept 2226", ISES Conference Asia, Tokyo, Japan
- 4/2014 "Economic feasibility of heat pump systems", presentation at the ASHRAE Annual Conference 2014, Seattle, USA
- 4/2014 "Concept 2226, a zero net energy building without active heating, cooling and ventilation system", presentation at the ASHRAE High Performance Building Conference 2014, San Francisco, USA
- 9/2013 "Improved fast calculating building optimization using the Climate Surface process" presentation ISES Conference, Cancun, Mexico
- 9/2013 "Improved fast calculating building optimization using the Climate Surface process" presentation CISBAT Conference Switzerland, International Conference about Sustainable Architecture, Lausanne, Switzerland
- 6/2010 "A novel computer simulation program for architects to calculate the energy performance of buildings", ETH Zurich (Swiss federal Institute of Technology in Zurich, Switzerland), Zurich, Switzerland
- 2010 "Sustainable Architecture Aspects of Baumschlager Eberle Architects" The Royal Danish Institute of Art, Copenhagen Department of Architecture, Copenhagen, Denmark
- 4/2006 "Simulation Software to advice architects in the design process" Center for Environmental Design Research , UC Berkely, Berkeley, USA
- 1/2004 "Daylighting and Shading in Offices in Hot Climates" OTTI Congress: "Innovative Daylight in Architecture", Bad Staffelstein (Germany)
- 9/2004 "Modern Versus Vernacular Shading Devices in India" University of Ahmedabad, Ahmedabad, India

#### EXHIBITED WORK

- 2015 Bern/ Switzerland  
Constructive Alps. Sustainable architecture in the alps  
Building 22/26  
<http://www.constructivealps.net/ausstellung/>
- 2014 Berlin / Germany  
AEDES am Pfaffenberg  
Building 22/26  
Aedes-arc.de

#### PUBLICATIONS WRITTEN BY OTHERS ABOUT MY WORK

- 2014 M. Pepchinski, 2226 Building Lead by Example: Baumschlager Eberle designs an elegant, efficient home for its own firm, Architectural Record, Vol. 202 Issue 7, p72, 1p
- 2014 J.Schoof ,House Without Heating: Office Building in Austria, DETAIL, 4/2014
- 2013 F. Aicher,Buerohaus "2226", Bauwelt 44.2013

2013 B. Mauerle, Burogebaude in Lustenau (A), Ruckbesinnung auf das Elementare, db deutsche bauzeitung 12|2013

#### **GRANTS**

5/2016 – 3/2017 Junghans, L. & Thun G., *Latitudo Borealis, Taubman College of Architecture Research Through Making Grant*, current, (\$20.000), ORSP

5/2016 – 8/2016 Junghans, L. (2016/5-2016/8), *Model Predictive Control in the Built Environment, Rackham Spring/Summer Research Grant*, accomplished, (\$8.000), ORSP

8/2015 – 8/2016 Junghans, L., *Sustainable Building Design optimization algorithm for early architectural design steps, Baumschlagwer Eberle Architects, Austria*, accomplished, (\$52.000), ORSP

8/2013 – 8/2014 Junghans, L., *Global Building Optimization using the Climate Surface Calculation Method, Office of the Vice President of Research OVPR, University of Michigan*, Seed funding opportunity, accomplished, (\$16.000), ORSP

8/2012 – 8/2013 Junghans, L., *Retrofitting of mechanical ventilation systems in North American homes using decentralized sensor and innovative controlled diffuser technology, Office of the Vice President of Research OVPR, University of Michigan*, Seed funding opportunity, accomplished, (\$20.000), ORSP

5/2011 – 8/2011 Junghans, L., *Building simulation on High Performance Project, Rackham Spring/Summer Research Grant*, accomplished, (\$6.000), ORSP

1/2011 – 12/2011 Junghans, L., *Zero Net Emission Office Building in the Cold Climate of Austria, Baumschlagwer Eberle Architects Austria*, accomplished, (\$20.000), ORSP

#### **GRANTS (Collaboration)**

9/2018 – 8/2021 Sirota A, Loejoy W, Junghans L., *Oakland Avenue Urban Farm, Water Stewardship Gardens, Erb Family Foundation*, Role: Co-PI, (\$215000)

5/2012 – 3/2014 Lynch, J. & Thun, G., *Integrated Responsive Building Envelopes, University of Michigan OVPR, Rackham Graduate School, Taubman College, College of Engineering, Special Projects Grant (Jointly Funded)*, Role: Co-PI, (\$534950)

1/2012 – 8/2013/8 Velikov, K., *The Pillow Case: Light Sensitive ETFE Prototyping, University of Michigan OVPR, Small Project Grant/Taubman College Research Fund*, Role: Co-PI, (\$14941), ORSP

5/2011 – 8/2011

Lynch, J. & Thun, G., The Cirrus Project, *University of Michigan WIMS ERC Strategic Seed Funding*, Role: Co-PI, (\$25000)

## **PRACTICAL/CREATIVE WORK**

2013

### **Concept 22/26, realized high performanc building project.**

Dr. Junghans was the leading engineer on the office building project Concept 22/26 in Austria. The introduced building concept goes beyond the conventional high performance building discussion by introducing an office building without any active systems for heating, cooling and ventilation. In an intensive collaboration between the worldwide known architect Dietmar Eberle and Dr. Junghans, the building envelope was improved to a level of performance where no active systems are needed any longer. The innovative building automation is the heard of the building energy concept. It controls the natural ventilation openings based on the internal carbon dioxide concentration, temperature levels and the occupant demands.

The building is accomplished in the middle of July 2013. Data in extreme external temperature periods are illustrating that the room temperatures are in the comfort field at every weather condition. The award winning building achieved international recognition.

### **Other realized projects with major contribution:**

2010

Bruckner University Innsbruck, Austria

Contribution: Project manager building energy concept and mechanical systems

Architect: Architekturburo 1, Realization: 2011, Construction value: \$75MM

2009

University of Luxemburg "Maison Savoir", Luxemburg

Contribution: Project manager building energy concept and mechanical systems

Architect: Baumschlager Eberle, Realization: 2010-11, Construction value: \$145MM

2009

High performance High Rise Residential Buildings, Shanghai, China

Contribution: Project manager building energy concept and mechanical systems

Architect: Baumschlager Eberle, Realization: 2011-12, Construction value: \$80MM

## **TEACHING**

**University of Michigan**

### **Taubman College of Architecture**

Classes in Building Physics, High Performance Building Design, Mechanical Building Systems, Building Optimization

2011 – 2017

Arch 505

High Performance Building Design

2014 – 2016	Arch 505	Building Optimization
2013 – 2016	Arch 505	Air and Wind in Architecture
2010 – 2014	Arch 315	Sustainable Systems I
2011 – 2017	Arch 425	Sustainable Systems II
2016	Arch 825	Area Seminar in Building Technology
2012	Arch 562	Comprehensive Studio/Technology
2011	A509	Hydro Lab

**Lecturer at: Hochschule Liechtenstein**

**Master Classes in Sustainable Architecture and Building Services**

**Education in:**

- Strategies in climate responsible architecture design
- Energy efficient building services (use of renewable resources)
- Principles for HVAC design

Teaching assistant

Doctoral studies at the ETH Zürich 2004-2006

**DISSERTATION COMMITTEE**

University of Michigan

2017 – current	PhD Dissertation Committee (chair), Hyeonsoo Kim
2012 – 2016	PhD Dissertation Committee (chair), Rudai Chan, Graduated 4/2016
2012 – 2016	PhD Dissertation Committee (chair), Nuri Bae, Graduated
2015 – current	PhD Dissertation Committee (chair), DeokOh Woo
2015 – 2018	PhD Dissertation Committee (member), Anahita Khodadadi
2015 – current	PhD Dissertation Committee (member), Omid Torghabehi

University of Sydney

2017 – 2018	PhD Dissertation Committee (member), Benjamin Slee
2013 – 2017	PhD Dissertation Committee (member), Margaret Liu

**TAUBMAN COLLEGE of ARCHITECTURE SERVICE**

2011	Architecture Admission / Scholarship Committee
2011	Faculty Search Committee (4 faculty members)
2012 – 2013	Architecture Chair Advisory Committee
2014	Architecture Admission / Scholarship Committee
2014 – 2016	Doctoral Studies in Architecture Advisory Committee, Representative of Building Technology Area

**PROFESSIONAL SERVICE**

Since 2013	Reviewer for the scientific journal Energy and Buildings
2014	Reviewer for the ARPAe grant of the US Department of Energy (DOE). The proposal was on local climate control in buildings. Washington, USA
2015	SimAUD2017 International Conference, Paper Reviewer
2016	ACADIA National Conference, Paper Reviewer
2016	Building Simulation Conference, Paper Reviewer



