

# Curriculum Vitae

## Alexander B. Suma, Ph.D.

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Combination of Architecture and Structural Engineering leads to an exceptional point of view to generate new possibilities in research and design. Alexander Suma combines these disciplines with the aim to challenge design problems supported with structural engineering knowledge to contribute to innovation for sustainable construction and renewable energy. In depth knowledge and experience was gained during his Ph.D. study at the University of Miami on non destructive evaluation techniques for concrete bridges in marine environments with emphasis on chemical assessment and acoustic emission monitoring.

### EDUCATION

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**Doctor of Philosophy**, Civil Engineering, College of Engineering, University of Miami, Coral Gables, Florida, USA, December 2010

**Master of Science**, Department of Building, Planning and Architecture, Eindhoven University of Technology, Eindhoven, the Netherlands, July 2007

**Master of Architecture**, Department of Building, Planning and Architecture, Eindhoven University of Technology, Eindhoven, the Netherlands, July 2007

**Bachelor of Science**, Structural Engineering, Eindhoven University of Technology, Eindhoven, the Netherlands, July 2006

**Bachelor of Professional Engineering**, Construction, major Structural Engineering, Hogeschool Zuyd, Heerlen, the Netherlands, July 2003

### PROFESSIONAL CERTIFICATIONS

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Registered architect, the Netherlands (Reg. Nr. 1.070915.008)

### CURRENT APPOINTMENT

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January 2011 – Present

**Scientist Innovator** at TNO Delft, Structural Assessment and Building Lab. Contribute to integration of technical science disciplines related to the built environment in order to create innovation as an answer to structural and civil engineering problems. Relevant example projects are AE Fatigue Monitoring Offshore Wind Mills, AE Monitoring of Concrete Bridges, Rapid Manufacturing Structural Elements, Innovation for Prevention Construction Errors, Concrete Multi-Scale FEM Modeling, Safety Distances Explosion Loads to Quay Walls and Offshore, Wind Loading High Rise Façade Elements, and Structural Field Testing.

### ACADEMIC/RESEARCH EXPERIENCES

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July 2007 – December 2010

**Lecturer**, University of Miami Department Civil, Architectural and Environmental Engineering, Coral Gables, FL, USA

Summer Scholars Program (SSP) from 2007 to 2010

- Introduction and preparation first year undergraduate courses in civil, architectural and environmental engineering
- Courses: Wind Engineering, Structural Dynamics, Fluid Mechanics, Introduction to Research, Structures Laboratory, Design Project /Design Competition and Field Trips
- From 2008 to 2010 coordinator for the CAE Department

January 2008 – December 2010

**Research Assistant** by NSF grant, University of Miami, Department Civil, Architectural and Environmental Engineering, Coral Gables, FL, USA

- Degradation study of rehabilitated RC bridge by means of non-destructive evaluation methods
- Assessment of the physical composition and deterioration by means of chemical evaluation
- Evaluation of structural capacity after repair of the concrete bridge by acoustic emission
- Statistical spatial variability studies of mapped results with nondestructive evaluation methods

January 2008 – December 2010

**Teaching Assistant**, University of Miami Department Civil, Architectural and Environmental Engineering, Coral Gables, FL, USA

- Prepare and teach Static I and II, Steel Design II and Mechanics of Solids I and II
- Evaluate and assist students for course projects, homework and exams
- Guidance of undergraduate students in their planning, starting, and development of their research project
- Mentor individual graduation studies towards honors degree undergraduate students

September 2005 – September 2006

**Organizing Committee**, International Conference Adaptables2006, Eindhoven University of Technology, Eindhoven, the Netherlands

In cooperation with professional organizations CIB, SMG IASS, Tensinet, BAM and Inbo.

## **NON-ACADEMIC EXPERIENCE**

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September 2007 – January 2008

**Architect**, Jo Coenen & Co Architecten, Amsterdam, Maastricht and Milan.

Architect and advisor for structural and building physics for lead architect

- Design of office buildings and hotels.
- Facade and morphology research and completion of the design of S12 in Parma, Italy.
- Urban design of Coolsingel, Rotterdam, the Netherlands.

## **ACADEMIC HONORS AND AWARDS**

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- **First price** in Research, Creativity, Innovation Forum and Citizens Award, University of Miami, April 2010
- **Keynote speaker** at UM Innovation Technology Showcase 2009, November 2009
- **International Travel Award** by NSF to attend and present research at the NSF CMMI Research and Innovation Conference 2009, Honolulu, Hawaii, June 2009
- **StudentenSTAALprijs 2007**, First Price for Novelty and First price for Technical Innovation, October 2007
- **Realization and placement** of price winning design Relax&Meet in the park of Government building of the Province of Limburg, Maastricht, The Netherlands, April 2007
- **Scholarship** of The Netherlands Florida Scholarship Foundation for study at University of Miami, travel expenses, housing and stipend, April 2007 – July 2007
- **Honors Award** for promising talent and appreciation of ambitions by Provinciale Staten van de Provincie Limburg, July 2005
- **First prize International Design Contest** PreC<sup>2</sup>OMP, Design: Relax & Meet, March 2005
- **Young Enterprise International**, University of Cambridge, March 2001

## INTELLECTUAL PROPERTIES

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- Upon request...

## SERVICES

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- **PR Executive Board Member YouCon**, Association for young professionals in structural engineering in the Netherlands, January 2011 - Present
- **Board member** of the Netherlands South-Florida Scholarship Foundation, January 2008 - Present
- **Senator** of the Graduate Student Association, April 2009 – December 2010
- **Webmaster** Research Center RB<sup>2</sup>C, University of Miami, June 2008 – June 2010
- **Realization and placement** of price winning design Relax&Meet at main entrance Eindhoven University of Technology Campus, Eindhoven, The Netherlands, June 2006
- **Organization and realization** SuperTube, 10<sup>th</sup> Lustrum Eindhoven University of Technology, September 2005 – June 2006
- **Initiator, president and PR board member**, pursuit Guinness World Records of world's largest bridge made of crates, current record 12.6 m. span, September 2004 – June 2005
- **President** of Student Association KOers, September 2004 - September 2005
- **Member board of directors** Betonvereniging, September 2004 - September 2005
- **Chair of Jury**, Design Competition for Crate Bridge Design, April 2004

## PROFESSIONAL MEMBERSHIPS

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- American Composites Manufacturers Association (ACMA)
- American Concrete Institute (ACI)
- American Institute of Steel Construction (AISC)
- American Society of Civil Engineering (ASCE)
- Betonvereniging, Dutch Concrete Association
- De Nieuwbouw, Association for Young Professionals in Construction
- Engineers Without Borders (EWB)
- YouCon, Association for Young Professional Structural Engineers

## RESEARCH INTERESTS

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- Integrated and Hybrid Design Solutions
- Energy in the Built Environment
- Sustainable Construction
- Wind Engineering
- Non Destructive Health Monitoring
- Acoustic Emission Monitoring
- Load and Field Testing
- Statistical Spatial Variability
- Fiber Reinforced Polymers
- Structure Rehabilitation

## ACADEMIC ADVIZING

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### Ph.D. Students

- Kassahun Minalu, "Acoustic Emission Studies of Slab Structure with Focus on Shear Failure Mechanism", Civil Engineering, TUDelft, January 2011 – December 2014
- Arthur Slobbe, "FEM Study for Load Testing of Bridges", Civil Engineering, TUDelft, September 2010 – August 2014

**Master Students**

- Chris Noteboom, “Zwermintelligentie,” Graduation Project, Structural Engineering and Architecture, TU/e, February 2011 – December 2011
- Maarten Braem, “Experimental Study to Friction of Sliding Cables in 3D Adaptable Building Skin,” Research Project, Structural Engineering, TU/e, January 2005 – January 2006

**Bachelor Students**

- Stephanos Stephani (Civil Engineering, Summa Cum Laude)
- Ida Qian Qu (Architecture)
- Thomas Edward Makowski (Civil Engineering)
- Brian Law (Architecture)
- Santiago Rodriguez (Civil Engineering)
- Caitlin Lundell (Civil Engineering)

**RESEARCH FUNDING**

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Upon request...

**PUBLICATIONS**

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**Journals**

- Suma, A.B., R.M. Ferraro, B. Metrovich, F. Matta, A. Nanni “*Non Destructive Evaluation Techniques and Acoustic Emission for Damage Assessment of Concrete Bridge in Marine Environment*,” ACI Special Publications Journal, ACI Spring Convention, Chicago, SP-277-8, pp. 109-128, March 2011.
- Suma, A.B., F. Van Herwijnen, J.C.T. Voorthuis “*3D Adaptable Building Skin: Adaptive Space as a Guide Through a Corridor*”, International Journal of Space Structures, Volume 22, Number 3, pp. 169-177(9), Multi-Science Publishing Co Ltd, September 2007.

**Conference Proceedings**

- Suma, A.B., C.A. van Bentum, T. Koster, and C.P.W. Geurts “The Effect of Cavity Flow on Pressure Equalization,” International Conference for Wind Engineering, ICWE13, Amsterdam, the Netherlands, 10-15 July 2011.
- Suma, A.B. “*3D Adaptable Building Skin: An Invention for Freedom in Shape of Façades*,” Adaptables2006, TU/e, International Conference on Adaptable Building Structures, Eindhoven, The Netherlands, 03-05 July 2006.

**Dissertations**

- Suma, A.B., “*Chemical and Acoustic Emission Evaluation of Concrete Bridge in Marine Environment*,” University of Miami, Coral Gables, Florida, USA, December 2010.
- Suma, A.B. “*3D Adaptable Building Skin, Mechanism Research and Corpus Viva Architectura*,” Eindhoven University of Technology, the Netherlands, July 2007.

**Presentations**

- Suma, A.B. “*Chemical and Acoustic Emission Evaluation of Concrete Bridge in Marine Environment*,” Delft University of Technology, MicroLab, Delft, the Netherlands, February 2011.
- Suma, A.B., R.M. Ferraro, B. Metrovich, F. Matta, and A. Nanni “*Non-Destructive Evaluation and Acoustic Emission for Damage Assessment of Concrete Bridge in Marine Environment*,” Recent Advances in Maintenance and Repair of Concrete Bridges (ACI Committee 345), American Concrete Institute Spring 2010 Convention, Chicago, IL, March 2010.
- Suma, A.B. “*Innovative Integrated Design for Wind Energy*,” UM Innovation Technology Showcase 2009, Miami, FL, Nov. 2009, [On Invitation].

- Suma, A.B. "*Innovative Integrated Design for Wind Energy*," NSF CMMI Research and Innovation Conference 2009, Honolulu, Hawaii, June 2009 [Awarded].
- Suma, A.B. "*Innovative Integrated Design for Wind Energy*", UM Innovation Technology Showcase 2009, Miami, FL, Nov. 2009, [On Invitation].
- Suma, A.B., R.M. Ferraro, B. Metrovich, F. Matta, A. Nanni "*Non Destructive Evaluation and Acoustic Emission Monitoring of RC Slab Bridge Exposed to Marine Environment*," ACI Fall Convention 2009, New Orleans, LA, November 2009.

### **Magazines**

- Nanni A., A.B. Suma, and B. Chernow "A Creative Mind at Work – Part II," .IT Italian Trade, Vol. 7, No. 1, pp. 31-33, March 2010.
- Nanni A., and A.B. Suma "A Creative Mind at Work – Part I," .IT Italian Trade, Vol. 6, No. 4, pp. 34-35, December 2009.
- Suma, A.B., "3D Adaptable Building Skin, Mechanism Research and Corpus Vivaera Architectura," KO/ersief, Eindhoven University of Technology, Vol. 73, pp. 18-20, October 2007.
- Suma, A.B., "3D Adaptable Building Skin/Corpus Vivaera Architectura," Bouwen met Staal, Vol. 198, pp. 29, October 2007.
- Suma, A.B., "3D Adaptable Building Skin, Mechanism Research Corpus Vivaera Architectura," Afstudeerbundel, Eindhoven University of Technology, pp. 98-99, September 2007.
- Suma, A.B., "Studieverenigingen KOers en SUPport Halen Wereldrecord Krattenbrug Bouwen!," KO/ersief, Eindhoven University of Technology, Vol. 67, pp. 22-27, Augustus 2005.
- Suma, A.B., "Studieverenigingen KOers en SUPport Halen Wereldrecord Krattenbrug Bouwen!," BV Nieuws, Betonvereniging, No. 5, pp. 19-20, August 2005.
- Suma A.B., "Zittend Mensen Ontmoeten," Tuin & Landschap, Magazine for Agriculture, Vol. 27-14, pp. 5, July 2005.
- Suma, A.B., "Relax & Meet," PreC<sup>2</sup>OMP, BIBM International Congress and Exhibition, RAI Congress Center Amsterdam, pp. 12-15, May 2005.
- Willems, R., A.B. Suma, I. Saitov, E. Wissen van, M. Ahammar, A. Kucukakyuz, and B. Weerts, "Wij Zijn Verschillend, Maar Toch Eén," Dagblad de Limburger, Regio Heuvelland, Regio Maastricht, pp. A3, July 2003.
- Willems, R., A.B. Suma, I. Saitov, E. Wissen van, M. Ahammar, A. Kucukakyuz, and B. Weerts, B., "Dikke Tien Voor Bijzonder Ontwerp," Dagblad de Limburger, LD Regio, pp. 13, July 2003.