

## Ricardo Zaurin

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### EDUCATION

#### **Doctor of Philosophy**

Civil Engineering, University of Central Florida, 2009  
Dissertation Title: "Structural Health Monitoring with Emphasis on Computer Vision, Damage Detection and Statistical Analysis"  
Advisor: Dr. F.Necati Catbas

#### **Master of Science**

Civil Engineering, "University of Central Florida, 2008"

#### **Master of Science**

Information Technology, University of Oriente (Venezuela), 1994  
Thesis Title: "Expert System to Assist the Specialist in Soil Classification"  
Advisor: Dr. Fernando Baeza

#### **Bachelor of Engineering**

Civil Engineering, University of Oriente (Venezuela), 1985  
Thesis Title: "Computer System for the Analysis and Design of Reinforced Concrete Frame Structures".  
Advisor: Prof. Rodolfo Rey

### PROFESSIONAL EXPERIENCE

#### **Lecturer (Fall 2010-present)**

University of Central Florida, Orlando, FL. Taught several graduate and undergraduate courses.

#### **Adjunct Professor (2008-2009)**

Valencia Community College, East Campus, Orlando FL  
Taught several undergraduate courses for the department of Mathematics.

#### **Associate Professor (March 1987-2011)**

Department of Civil Engineering, University of Oriente, Anzoategui Campus, Venezuela.  
Design and taught several undergraduate Civil Engineering courses as well as advised several thesis.

#### **Adjunct Professor (2006-Present)**

Metro Orlando University System, Orlando, FL.

Design and taught several undergraduate as well as graduate courses for the areas of Mathematics, Human Resources, and Management.

**Graduate Researcher Assistant/Graduate Teaching Assistant (2006-Present)**

University of Central Florida, Orlando, FL.

- Participated in research on health monitoring techniques for safety assessment and efficient management of structures.
- Co-Managed a research project with Florida Department of Transportation involving research and implementation (Project No's: BD548-11 and BD248-23)
- Investigation of movable bridge maintenance problems, finite element modeling, instrumentation plan and remote monitoring applications.

**Civil Engineer/Land Developer (1987-2002)**

Desarrollos Stevic, Inc (President)

Desarrollos Z.M.1, Inc (President)

Desarrollos Ibiza, Inc (Vice President)

All three corporations are dedicated to the promotion, design, management, construction and inspection civil structures. The following is a list of some of the buildings/subdivisions developed.

- Residencias Marsella: Steel-Frame based building. Barcelona, Venezuela. (16 apartment-homes, (2,200 m<sup>2</sup>).<sup>3</sup>
- Residencias IBIZA: Reinforced concrete building. Lechería, Venezuela (9 Town houses ).
- Residencias Coral Palace: Reinforced concrete building. Lechería. Venezuela. (20 apartments, 12 story building. (2,800 m<sup>2</sup>).
- Conjunto Residencial Laguna Vieja: Twenty eight single family homes of 350 m<sup>2</sup> living area. Steel/reinforced concrete structure. Land development area = 20,000 m<sup>2</sup>.
- Residencias Flamingo Suites: Reinforced concrete building. Barcelona, Venezuela. (15 apartments, 12 stories. (3,700 m<sup>2</sup> )
- Residencias Colina Suites. Reinforced concrete building. Barcelona, Venezuela. (28 apartments, 8 stories (2,700 m<sup>2</sup>)

**Resident Engineer (1987-1991)** Desarrollos N1, Inc: for the subdivision "Puerto Principe". 280 town-homes, two-2,000m<sup>2</sup> building, Lechería, Venezuela.

**Manager of Project Division (1985-1986)** Transregional of Engineering, TRANSICA, Inc. In charge of designing, developing, and constructing several houses for private investors.

**Structural Engineer (1985):** Responsible for the analysis and structural design of the "HOTEL RASIL". Pto. La Cruz, Venezuela. Reinforced concrete frame-based structure-26 stories/40,000 m<sup>2</sup>

**Manager for the Computers Division** (1984-1985) Multicontrol Oriente, Inc

**Undergraduate Teaching Assistant for the computer center** (1982-1985)  
Universidad de Oriente, Venezuela.

### **HONORS AND AWARDS**

Lecturer Gold Apple Award (Builders of the Realm Nov. 2012)

Golden Apple 2011 UCF (Awarded by students-2011)

Nominated Golden Apple 2010 UCF

**Nominated** for Innovative Thesis or Dissertation Award UCF (2009)

**Nominated** to the Award for Excellence by a Graduate Teaching Assistant UCF (2009)

**Awarded** with the “Outstanding GTA Builders of Realm” UCF (2009)

**Nominated** to the “Dick DeMichele Scholarship Award” IMAC XXVIII (2009)

**Honor to the Merit-20 years of teaching.** Universidad de Oriente, Venezuela. (2007)

**Awarded** Scholarship for PhD studies Universidad de Oriente, Venezuela. (2002)

**Honor to the Merit-15 years of teaching.** Universidad de Oriente, Venezuela. (2002)

**Honor to the Merit-10 years of teaching.** Universidad de Oriente, Venezuela. (1997)

**Honor to the Merit -5 years of teaching.** Universidad de Oriente, Venezuela. (1992)

**Awarded** Cum Laude Bachelor Universidad de Oriente, Venezuela (1985)

**Awarded** FGMA Scholarship for Undergraduate Studies. Venezuela (1982-1985)

**Awarded** Meneven Scholarship for Undergraduate Studies. Venezuela (1982-1985)

### **TEACHING EXPERIENCE**

#### **Lecturer (Fall 2010-present)**

University of Central Florida, Orlando, FL.

- EGN 3310 (Engineering Analysis: Statics-7 times)
- EGN3331 (Mechanics of Materials-4 times)
- CES 4100 (Structural Analysis-1 time)
- CEG4011C (Geotechnical Engineering-7 times)
- CES 4702 (Reinforced Concrete Structures-3 times)
- CES 5606 (Advanced Steel Structures-3 times)

#### **Adjunct Professor** (2008-2009)

Valencia Community College, East Campus, Orlando FL

- MAT0012C “Pre Algebra”
- MAT0024C “Beginning Algebra”

#### **Graduate Teaching Assistant**

University of Central Florida, Orlando, FL. (Spring 2007-Spring 2009)

- Spring 2007 GTA for CES 4101
- Spring 2007 GTA for CES 6209
- Spring 2008 GTA for ENG 3310

- Fall 2008 Instructor for EGN-3310 Engineering Mechanics: Statics (Aprox. 200 students)
- Spring 2009 Instructor for EGN-3310 Engineering Mechanics: Statics (Aprox. 200 students)
- Fall 2009 GTA for CES 5937 Matrix Methods for Structural Analysis

### **Adjunct Professor**

Valencia Community College, East Campus, Orlando FL. (2008-Present)

- MAT0012C (Pre Algebra)
- MAT0024C (Beginning Algebra)

### **Associate Professor**

Department of Civil Engineering, University of Oriente, Anzoategui Campus, Venezuela. (March 1987-2011)

- 0704362 Prestressed Concrete
- 0704473 Reinforced Concrete
- 0702233 Engineering Mechanics
- 0612852 Rational Mechanics: Statics
- 0703653 Mechanics of Materials
- 0704302 Advanced Mechanics of Materials

### **Adjunct Professor**

Technological Institute/College “Antonio José de Sucre. Barcelona, Venezuela (1986)

- Construction I
- Introduction to Computers
- Soil Mechanics

## **RESEARCH INTEREST**

Structural Health Monitoring (SHM) of fixed and movable bridges, damage detection and identification, condition assessment, numerical simulations, and non-destructive evaluation of existing structures, design and implementation of smart structures.

## **GRANTS AND FUNDED PROPOSALS**

I very closely worked with my advisor in the preparation of the following proposals:

- Integrative Information System Design for Florida DOT Structural, Maintenance and Traffic Operations” funded with \$162,541.
- Long Term Monitoring Demonstration on a Movable Bridge- FDOT funded with \$286,251.

## JOURNAL PAPERS

1. Catbas, F. Necati; Gul, Mustafa; Gokce, Hasan Burak; **Zaurin, Ricardo**; Frangopol, Dan M.; Grimmelsman, Kirk A (2012) . "Critical Issues, Condition Assessment and Monitoring of Heavy Movable Structures: Emphasis on Movable Bridges". Accepted Under Revision.
2. N. Catbas, **R. Zaurin** (2011), “Sensor networks, Computer Imaging and Unit Influence Lines for Structural Health Monitoring: A Case Study for Bridge Load Rating” Journal of Bridge Engineering. December 7, 2011.  
doi:10.1061/(ASCE)BE.1943-5592.0000288
3. **Zaurin, R.** and Catbas, F.N.(2009), "Integration Of Computer Imaging And Sensor Data For Structural Health Monitoring Of Bridges” Journal of Smart Materials and Structures 19 015019 doi:10.1088/0964-1726/19/1/015019
4. **Zaurin R.**, Catbas, F.N., (2011), “Structural Health Monitoring Using Computer Vision And Influence Lines” Journal of Structural Health Monitoring. May 2011 10: 309-332. doi:10.1177/1475921710373290

## BOOKS

1. **Zaurin, Ricardo** (1998). “Solved Problems for Engineering Mechanics: Statics”. Edited in Spanish by the Universidad de Oriente. Venezuela
2. **Zaurin, Ricardo** (2001). “Engineering Mechanics: Theory and Practice”. Edited in Spanish by the Universidad de Oriente. Venezuela.

## CONFERENCE PAPERS

1. F. Catbas, M. Gul, H. Gokce, T. Dumlupinar, and **R. Zaurin** (2010). “Use of Statistical Analysis, Computer Vision, and Reliability for Structural Health Monitoring” ASCE, Structures Congress 2010. Bridges II, pp. 395-402, (doi 10.1061/41130(369)37)
2. R. Zaurin and N. Catbas(2010). “Integration of Computer Imaging and Sensor Networks for Structural Health Monitoring: Case Study for Load Rating”. TRB 89th Annual Meeting (Transportation Research Board). Washington DC, 2010.
3. F. Catbas, **R. Zaurin**, M. Gul, A. Sardinias, T. Dumlupinar, H. Gokce, and T. Terrell. (2010) “ Heavy Movable Structure Health Monitoring: A Case Study with a Movable Bridge in Florida”. ASCE Structures Congress 2010. Bridges I, pp. 146-153, (doi 10.1061/41130(369)15)
4. **R. Zaurin**, F. N. Catbas. (2010). “Structural Health Monitoring for Damage Detection based on Integration of Computer Imaging and Sensor Data”.

- International Conference on Bridge Maintenance, Safety and Management, IABMAS 2010. July 11-15, 2010. Pennsylvania, Philadelphia, USA
5. F. N. Catbas, H. B. Gokce, T. Dumlupinar, **R. Zaurin**, M. Gul, T. Terrell, D. Harper, D. M. Frangopol. "Maintenance Monitoring System Design of a Movable Bridge". International Conference on Bridge Maintenance, Safety and Management, IABMAS 2010. July 11-15, 2010. Pennsylvania, Philadelphia, USA
  6. **Zaurin R.** & Catbas F.N "Computer Vision for Structural Health Monitoring and Damage Detection of Bridges". International Modal Analysis Conference (IMAC XXVIII), Jacksonville, FL February 1 – February 4, 2010
  7. Catbas, F. N., Gul, M., **Zaurin, R.**, Terrel, T., Dere, Y., Ansley, M., Frangopol, D. M. and Grimmelsman, K. (2009) "Structural Health Monitoring for the Safety of Bridges: Fundamental, Application and Organizational Considerations", ASCE Structures Congress '09, April 30-May 2, Austin, TX.
  8. Catbas, F. N., Gul, M., **Zaurin, R.**, Gokce, H. B., Maier, D., Terrell, T. (2008), "Structural Health Monitoring for Life Cycle Management of Bridges", International Association for Life-Cycle Civil Engineering, June 11-14, Varenna, Lake Como, Italy.
  9. **Zaurin, R.** & Catbas, F. N. (2008), Demonstration of a Computer Vision and Sensor Fusion Structural Health Monitoring Framework on UCF
  10. **Zaurin, R.** and Catbas, F.N. (2008), Benchmark Studies for Structural Health Monitoring using Computer Vision Fourth International Conference on Bridge Maintenance, Safety and Management, IABMAS'08.Seoul, Korea, Jul 13-17, 2008
  11. **Zaurin, R.** and Catbas, F.N. (2008), "Demonstration of a Computer Vision and Sensor Fusion for Structural Health Monitoring on UCF 4-Span Bridge" Proceedings of the 26th International Modal Analysis Conference, Orlando, FL, Feb. 4-Feb.7, 2008
  12. F. N. Catbas, D. M. Frangopol, **R. Zaurin** and M. Susoy. "System Reliability-Based Structural Health Monitoring with FEM Simulation". Proceedings of the 3rd International Conference on Structural Health Monitoring of Intelligent Infrastructure (SHMII-3), November 14-16, 2007, Vancouver, British Columbia, Canada.
  13. Susoy, M., **Zaurin, R.** and Catbas, F.N., "Development of a Structural Health Monitoring Framework for the Movable Bridges in Florida," Proceedings of the 86th Annual Meeting of Transportation Research Board, TRB, Washington DC, 2007
  14. Susoy, M., **Zaurin, R.** and Catbas, F.N., "Reliability of a Movable Bridge By Means of a Field Calibrated Model", Proceedings of the 87th Annual Meeting of Transportation Research Board (TRB), Washington DC, 2007
  15. Caicedo, JM, Catbas, F.N., Gul, M, **Zaurin, R.** (2007), "Phase I of the Benchmark Problem for Bridge Health Monitoring: Numerical Data," Proceedings of the 18th Engineering Mechanics Division Conference of the ASCE, June 3-6, 2007, Virginia Tech, Blacksburg, VA.
  16. **Zaurin, R.** and Catbas, F.N. (2007) "Issues in Using Video Images for Structural Health Monitoring", Proceedings of the World Forum on Smart Materials and Smart Structures Technology, May 22-27, 2007, Chongqing and Nanjing, China.

17. Caicedo, J.M., Catbas, F.N., Gul\*, M., **Zaurin, R.** and Dyke, S.J. (2006), “Benchmark Problem for Bridge Health Monitoring: Definition Paper,” Proceedings of the World Conference on Structural Control and Monitoring, 11-13 July 2006, San Diego, California.

## **TECHNICAL REPORTS**

1. Catbas, F. N., **Zaurin, R.**, Susoy, M., and Gul, M. (2007) “Integrative Information System Design for Florida Department of Transportation–A Framework for Structural Health Monitoring of Movable Bridges”, Final Report to Florida Department of Transportation, Contract No. BD548-RPWO#11, 231 pages.
2. Catbas, N., Gul, M, **Zaurin, R.**, Dumlupinar T., Gokce H.B., “Long Term Monitoring Demonstration on a Movable Bridge” Final Report to Florida Department of Transportation, 2010. Contract No. BD-548-23, 209 pages.

## **THESES**

1. **Zaurin, R.** (2009), “Structural Health Monitoring with Emphasis on Computer Vision, Damage Detection and Statistical Analysis”, PhD. Dissertation, Department of Civil, Environmental, and Construction Engineering, University of Central Florida.
2. **Zaurin, R.** (1994), “Expert System to Assist the Specialist on Soil Classification” Master in Information Technolgy Thesis. Universidad de Oriente. Venezuela.
3. **Zaurin, R.** (1985), “Computer System for the Analysis and Design of Reinforced Frame Structures”. Civil Engineer Thesis. Department of Civil Engineering, Universidad de Oriente. Venezuela.

## **PRESENTATIONS**

1. F. Necati Catbas, Mustafa Gul and **Ricardo Zaurin** (2009),” Integration of Fundamental–Applied Studies and Laboratory–Field Demonstrations for Structural Health Monitoring of Transportation Infrastructure”. University of Central Florida. Developing an Infrastructure Agenda for Transportation Infrastructure Preservation and Renewal TRB Nov 12-13 2009, Washington DC

## **PROFESSIONAL MEMBERSHIPS AND ORGANIZATIONS**

**CIV** (Venezuelan Society of Engineers).Venezuela 1986-present.

**APUDO** (Professors Association of the University of Oriente) Venezuela. 1987-present.