

F. Necati Catbas, PhD, PE, F. ASCE, F. SEI
Professor of Civil Engineering

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University of Central Florida, Orlando, Florida, USA

Education:

- 1998:** Post-doctoral Research, Drexel University, Philadelphia, Pennsylvania.
- 1997:** Ph.D. in Civil Engineering, University of Cincinnati, Cincinnati, Ohio.
- 1993:** M.S. in Civil Engineering, Bogazici University, Istanbul, Turkey.
- 1991:** B.S. in Civil Engineering, Bogazici University, Istanbul, Turkey.

Professional Experience:

- 2003- 2013:** Professor, Associate Professor and Assistant Professor, Civil, Environmental and Construction Engineering (CECE) Department, University of Central Florida
- 2008- 2013:** Associate Department Chair, Civil, Environmental and Construction Engineering (CECE) Department, University of Central Florida
- 1999 – 2003:** Research Assistant Professor, Intelligent Infrastructure Institute, Drexel University and Adjunct Professor at Dept. of Mechanical Engineering & Engineering Mechanics, Drexel University
- 1998 – 1999:** Research Associate, Intelligent Infrastructure Institute, Drexel University and Adjunct Professor at Dept. of Mechanical Engineering & Engineering Mechanics, Drexel University

Professional Memberships and Service:

- Chair,** “System Identification of Constructed Facilities” Structural Engineering Institute (SEI) Technical Committee, American Society of Civil Engineers (ASCE)
- Chair,** “Civil Structures Testing Technical Division”, Society for Experimental Mechanics (SEM)
- Past Council Secretary,** Technical Council on Life-Cycle Performance, Safety, Reliability and Risk of Structural Systems, Structural Engineering Institute (SEI) Technical Committee, American Society of Civil Engineers (ASCE)
- Past Chair,** “Safety of Bridges” Structural Engineering Institute (SEI) Technical Committee, American Society of Civil Engineers (ASCE)
- Member,** “Methods of Monitoring and Evaluating Structural Performance Committee” Structural Engineering Institute (SEI) Technical Committee, American Society of Civil Engineers (ASCE)
- Member,** “Structural Health Monitoring and Control Engineering” Engineering Mechanics Institute (EMI) Technical Committee, American Society of Civil Engineers (ASCE)
- Member,** AFF 40 Field testing and NDE of Transportation Structures, Transportation Research Board (TRB)
- Secretary,** Bridge Health Monitoring Committee, International Association for Bridge Maintenance and Safety (IABMAS)

Current Editorial Board Membership:

- Associate Editor,** Journal of Structural, American Society of Civil Engineers (ASCE)
- Associate Editor,** Structure and Infrastructure Engineering, Taylor and Francis
- Associate Editor,** Structural Monitoring and Maintenance, Tecno-Press

Honors and Awards:

- 2014,** Elected Fellow, Structural Engineering Institute (SEI)
- 2013,** Elected Fellow, American Society of Civil Engineers (ASCE)
- 2013,** Nomination to Executive Board, Society for Experimental Mechanics (term to start in 2014)
- 2013,** Certificate of Appreciation by the Institution of Structural Engineers and Tongji University
- 2013,** Invitee by the Royal Academy of Engineering for Global Grand Engineering Challenges Summit in London, UK
- 2012,** College of Engineering and Computer Science Excellence in Professional Service Award
- 2011,** US Delegate, National Academy of Engineering Europe-America Frontiers of Engineering
- 2011,** Plaque for Appreciation by the President of Duzce University, Turkey
- 2010,** NASA Certificate of Recognition, NASA Glenn Research Center
- 2010,** University Excellence in Graduate Teaching Award

- 2010, College Excellence in Graduate Teaching Award
 2009, Travel Award from Tokyo to Sapporo and to Osaka from Japan Technical Committee
 2009, Outstanding Graduate Advising and Graduate Teaching Awards Award, Civil, Environmental and Construction Department, Presented at the Annual Builders of the Realm Celebration
 2009, State University System Teaching Incentive Program (TIP) Award
 2009, State University System Research Incentive Award (RIA)
 2008, Outstanding Researcher Award, Civil, Environmental and Construction Department, Presented at the Annual Builders of the Realm Celebration

Teaching Interests and Experience:

Undergraduate Courses

EGN 1007: Engineering Concepts and Methods
 ENG 3310 Engineering Mechanics- Statics
 CES 4100 Structural Analysis I
 CES 4101 Structural Analysis II

Graduate Courses

CES 5937/5144 Matrix Structural Analysis
 CES 5325 Bridge Engineering
 CES 6116 Finite Element Analysis
 CES 6209 Dynamics of Structures
 CES 6971 Independent Studies
 MEM 800-566/567/568 System Dynamic Analysis I-II-III

Research Funding

Completed and on-going research projects sponsored with support from federal, state, local agencies and private companies within US and from abroad. Dr Catbas induced into the 2008 Class of the University of Central Florida Millionaire's Club.

Patent

Development of *iSee (image based Structural Engineering Evaluation)*," (filed 08/19/2013, patent application #61/867,352 & UCF#-32830)

Selected Publications: (out of more than 240 journal, conference and report publications)

Book and Book Chapters

- Catbas, F.N.**, Kijewski-Correa, Aktan, A.E. (Eds.) (2013) "Structural Identification of Constructed Systems: Approaches, Methods and Technologies for Effective Proactive of Structural Identification", American Society of Civil Engineers (ASCE) Structural Engineering Institute (SEI), ISBN 978-07-8441-1971, 2013 (234 pages)
- Catbas, F.N.**; Pakzad, S.; Racic, V.; Pavic, A.; Reynolds, P. (Eds.) (2013) "Topics on the Dynamics of Civil Structures", *Society for Experimental Mechanics Series, Vol. 4*, Springer, ISBN 978-1-4614-6554-6, 2013 (561 pages)
- Gul, M., and **Catbas, F. N.** (2012). " Chapter 12: Signal Processing for Sensing and Monitoring Civil Infrastructure Systems," *Intelligent Sensor Networks: Across Sensing, Signal Processing, and Machine Learning* - Taylor & Francis LLC, CRC Press, 2012, Chapter 12, pages 267-305, 2012, (invited)

Fundamental Research and Development

- Catbas, F.N., and Kijewski-Correa, T. (2013) "Structural Identification of Constructed Systems: A Collective Effort Toward an Integrated Approach That Reduces Barriers to Adoption," Journal of Structural Engineering, ASCE, Vol. 139, No. 10, pp.1648-1653 .
- Catbas, F.N., Gokce, H.B. and Gul, M. (2012) "A Practical Methodology for Load Rating of Existing Highway Bridges: Demonstration on Reinforced Concrete T-Beam Bridges," Journal of Bridge Engineering, 17(4), 652–661, ASCE doi:http://dx.doi.org/10.1061/(ASCE)BE.1943-5592.0000284
- Zaurin, R. and Catbas, F.N. (2010), "Integration of Computer Imaging and Sensor Data for Structural Health Monitoring of Bridges," Journal of Smart Materials & Structures, 2010 (19)
- Gul, M. and Catbas, F. N. (2009) "Statistical Pattern Recognition for Structural Health Monitoring using Time Series Modeling: Theory and Experimental Verifications", Mechanical Systems and Signal Processing, Volume 23, Issue 7, October 2009, Pages 2192-2204, Elsevier, 2009.
- Catbas, F.N., Gul, M., Burkett, J. "Structural Condition Assessment: Phenomenological Model Development and Laboratory Studies," Journal of Smart Materials & Systems, 17 (2008)

Catbas, F.N., Aktan, A.E., Brown, D.L. (2004), "Parameter Estimation for Multiple Input Multiple Output Analysis of Large Structures," Journal of Engineering Mechanics, ASCE, Vol.130, No.8, pp.921-930, August 2004.

Aktan, A. E., Catbas, F.N., Turer, A. and Zhang, Z., "Structural Identification: Analytical Arts", Journal of Structural Engineering, ASCE, Vol.124, No.7, July, 1997, p.817- 829.

Benchmark Verification and Validation Studies

Catbas, F.N., Gokce, H.B. and Frangopol, D.M. (2013) "Predictive Analysis by Incorporating Uncertainty through a Family of Models Calibrated with Structural Health Monitoring Data," Journal of Engineering Mechanics, ASCE, Vol. 139, No. 6, pp. 712-724.

Gul, M. and Catbas, F. N. (2011) "Structural Health Monitoring and Damage Assessment using a Novel Time Series Analysis Methodology with Sensor Clustering", Journal of Sound and Vibration, Elsevier, 330 (6), p.1196, Mar 2011

Shmerling, R.Z. and Catbas, F.N. (2010), "Visualization, Finite Element Modeling and Analysis of Aerial Guideways," Structure and Infrastructure Engineering Journal, SIE, Volume 6, Issue 4, Pages 447 – 465.

Catbas, F.N., Gul, M., Burkett, J. (2008) "Conceptual Damage-Sensitive Features for Structural Health Monitoring: Laboratory and Field Demonstrations," Journal of Mechanical Systems and Signal Processing, Elsevier, 22, 1650-1669, 2008

Catbas, F.N., Caicedo, J.M. and Dyke, S. J. (2006), "Development of a Benchmark Problem for Bridge Health Monitoring," Proceedings of the International Conference on Bridge Maintenance, Safety and Management, IABMAS, Porto, Portugal, July, 16-19, 2006.

Catbas, F.N., Grimmelsman, K.A., Barrish, R.A., A.E. Aktan, "NDE of Tuned-Mass-Damper Type Vibration Absorbers using Vibration Signatures," Journal of Materials in Civil Engineering, ASCE, Vol. 15, No.6, pp.557-566, 2003.

Large Scale, Real Life Implementations

Gokce, H.B. Catbas, F.N., Gul, M. and Frangopol, D.M. (2013) "Structural Identification for Performance Prediction by Considering Uncertainties through a Family of Models," Journal of Structural Engineering, ASCE, Vol. 139, No. 10, pp.1703-1716.

Catbas, F.N., Zaurin, R., Gul, M. and Gokce, B. (2012) "Sensor networks, Computer Imaging and Unit Influence Lines for Structural Health Monitoring: A Case Study for Bridge Load Rating," Journal of Bridge Engineering, ASCE, 17(4), 662–670, 2012 (doi:http://dx.doi.org/10.1061/(ASCE)BE.1943-5592.0000288)

Gokce, H.B., Catbas, F.N., and Dan M. Frangopol (2011) "System Reliability and Load Rating Evaluation of a Movable Bridge," Journal of Transportation Research Record, No. 2251, Transportation Research Board of the National Academies, Washington, D.C., 2011, pp. 114–122. DOI: 10.3141/2251-12

Gul, M. and Catbas, F.N. (2011) "Damage Assessment with Ambient Vibration Data using a Novel Time Series Analysis Methodology," Journal of Structural Engineering, ASCE, 2011 ASCE, 2011 Vol. 137, No. 12, pp.1518-1526, December 1, 2011

Gul, M. and Catbas, F.N. (2009), "Dynamic Response Monitoring and Correlation to Crowd Movement at a Football Stadium," Proceedings of the 27th International Modal Analysis Conference, Orlando, FL, Feb. 9-Feb.12, 2009

Shmerling, R.Z. and Catbas, F.N., "Load Rating and Reliability Analysis of An Aerial Guideways," Journal of Bridge Engineering, Volume 14, Issue 4, pp. 247-256 (July/August 2009) ASCE, 2009.

Gul, M. and Catbas, F.N., "Ambient Vibration Data Analysis for Structural Identification and Global Condition Assessment," J. of Engineering Mechanics, ASCE, Vol 134, No 8, pp. 650-662, 2008

Catbas, F.N., Susoy, M., Frangopol, D. (2008), "Structural Health Monitoring and Analytical Modeling for Reliability Estimation of Long Span Bridges," Journal of Engineering Structures, Elsevier, 30, 2347-2359, 2008.

Catbas, F.N., Grimmelsman, K.A., Ciloglu, S.K., Burgos-Gil, I. and Coll-Borgo, M., "Static and Dynamic Testing of a Concrete T-beam Bridge Before and After Carbon Fiber Reinforced Polymer Retrofit", Transportation Research Record (TRR), Journal of the Transportation Research Board, ISSN 0361-1981, Issue 1976, 2006, pp.77-87.

Catbas, F.N. and Aktan, A.E. "Condition and Damage Assessment: Issues and Some Promising Indices", Journal of Structural Engineering, ASCE, Vol.128, No. 8, pp.1026-1036, 2002.

Aktan, A.E., Catbas, F.N., Grimmelsman, K.A. and Tsikos, C.J. "Health Monitoring of Large Infrastructure Systems for Management", ASCE, Journal of Engineering Mechanics, v126, n7, 2000.