

Dissertations and Theses Completed under Prof. Bažant's Advisorship, and Collaborators

May 25, 2018

1 Ph.D. Dissertations

1. Martin K. Christensen, *Field Solutions for Large Regular Frameworks under Initial Stress*, June 1973.
2. Leonard J. Najjar, *Environmental Factors and Prediction of Structural Effects in Creep of Concrete*, June 1973.
3. Spencer T. Wu, *Rate-Type Creep Law of Aging Concrete in Variable Environment*, August 1973.
4. Vicente Cuellar, *Rearrangement Measure Theory Applied to Dynamic Behavior of Sand*, August 1974 (co-advised with R.J. Krizek).
5. Mahjoub M. ElNimeiri, *Stability and Large Deflections of Curved Thin-Walled Girders*, June 1974.
6. Ibrahim Kutay Ozaydin, *A Micro-Mechanistic Analysis of Creep Response of Kaolin Clay*, June 1974 (co-advised with R.J. Krizek).
7. Ali A. Asghari, *Experimental and Numerical Investigation of the Effects of Variable Humidity, Aging and Stress Nonlinearity on Creep of Concrete*, August 1975.
8. Parameshwara D. Bhat, *Endochronic Theory of Inelasticity and Failure of Concrete with Application to Seismic-Type Cyclic Loading*, June 1976.
9. Elmamoun Abdalla Osman, *Prediction of Creep and Shrinkage of Concrete and Its Modeling as a Stochastic Process*, June 1976.
10. Atilla M. Ansal, *An Endochronic Constitutive Law for Normally Consolidated Cohesive Soils*, June 1977 (co-advised with R.J. Krizek).
11. John Louis Glazik, *Numerical Analysis of Elastodynamic Near-Tip Stress Fields for Stationary and Propagating Cracks*, June 1977 (co-advised with J.D. Achenbach).
12. Werapol Thonguthai, *Creep and High Temperature Effects on Pore Pressure and Drying of Concrete*, August 1977.
13. Rafael Blázquez, *Endochronic Model for Liquefaction of Sand Deposits as Inelastic Two-Phase Media*, June 1978 (co-advised with R.J. Krizek).
14. Ali A. El Zaroughi, *Application of Endochronic Constitutive Law to One-Dimensional Liquefaction of Sand*, June 1978 (co-advised with R.J. Krizek).
15. Sang-Sik Kim, *Theoretical and Experimental Investigation of Nonlinear Behavior and Creep of Concrete*, August 1978.
16. Liisa Panula, *Practical Prediction of Time-Dependent Deformations and Failure of Concrete*, August 1978.
17. Luis F. Estenssoro, *The Surface Singularity of Cracks*, August 1979.
18. Celal Sener, *An Endochronic Nonlinear Inelastic Constitutive Law for Cohesionless Soils Subjected to Dynamic Loads*, August 1979 (co-advised with R.J. Krizek).
19. Tatsuya Tsubaki, *Nonlinear Response of Plain Concrete and Cracked Reinforced Concrete*, August 1979.
20. Byung-Hwan Oh, *Mathematical Models for Inelastic Behavior and Cracking of Concrete Structures*, July 1982.
21. Jenn-Chuan Chern, *Creep Law of Concrete, Its Uncertainty and Effects of Drying and Cracking*, 1984.
22. Ta-Peng Chang, *Finite Element Modeling of Strain-Softening and Failure in Concrete*, 1985.
23. Jin-Keun Kim, *Fracture and Inelastic Constitutive Relations for Concrete and Geomaterials*,

1985.

24. Phillip A. Pfeiffer, *Size Effect in Blunt Fracture*, 1986.
25. Feng-Bao Lin, *Plasticity with Nonlocal Strain-Softening and Material Instabilities*, 1987.
26. Gilles Pijaudier Cabot, *Nonlocal Strain Softening Material Instabilities*, 1987.
27. Pere C. Prat, *Micromechanics Modeling and Fracture of Concrete and Geomaterials*, 1987.
28. Santosh Prasanna, *Nonlinear and Thermal Effects in Concrete Creep — Experiment and Theory*, 1989.
29. Mazen R. Tabbara, *Fracture and Stability of Strain-Softening Materials and Structures*, 1990.
30. Joong-Koo Kim, *Prediction of Time-Dependent Deformations of Concrete and Bridge Deflection Probability*, 1990.
31. Mohammed T. Kazemi, *Fracture Characteristics of Quasi-brittle Materials from the Size Effect Method and Implications in Design*, 1990.
32. Yunping Xi, *Analysis of Concrete Creep, Shrinkage and Fracture by Deterministic and Probabilistic Methods*, 1991.
33. Ravindra Gettu, *Concrete and Rock Fracture and the Influence of Loading Rate*, 1992.
34. Milan Jirásek, *Modeling of Fracture and Damage in Quasibrittle Materials*, 1993.
36. Zhengzhi Li, *Fracture Size Effect and Damage Properties of Quasibrittle Materials*, 1995.
37. Yuyin Xiang, *Modeling of Fracture and Scaling in Quasi-Brittle Materials*, 1996.
38. Sandeep Baweja, *Long-Term Deformations of Concrete, Practical Prediction, Effect of Composition and Mechanisms*, 1996.
39. Sanjeev Tandon, *Fracture Behavior of Quasi-Brittle Material*, 1997 (co-advised with K.T. Faber).
40. Jang-Jay Ho Kim, *Failure Mechanisms and Size Effect of Quasi-Brittle Materials: Ice, Steel Reinforced Concrete and Fiber Composite*, 1998.
41. Michele Brocca, *Material Modeling and Structural Analysis with the Microplane Constitutive Model*, 1999.
42. Ferhun C. Caner, *Computational Modeling of Damage and Fracture in Concrete*, 2000.
43. Emilie Becq-Giraudon, *Size Effect on Fracture and Ductility of Concrete and Fiber Composites*, 2000.
44. Goangseup Zi, *Size Effect of Quasibrittle Materials and Simulation of Concrete Decontamination Using Microwave Heating*, 2002.
45. Zaoyang Guo, *Size Effect Analysis of Materials and Structures from Micro Scale to Macro Scale*, 2004.
46. Yong Zhou, *Size Effect on Strength of Fiber Composites and Rigid Foams*, 2005.
47. Alessandro Beghini, *Stability and Quasibrittle Failure of Fibrous and Particulate Composites*, 2005.
48. Sze-Dai Pang, *Probabilistic Size Effect in Fracture of Quasibrittle Materials*, 2005.
49. Martin G. Andrews, *The Static and Dynamic Interaction of Multiple Delaminations in Plates Subject to Cylindrical Bending* (co-advised, principal advisor: Prof. Roberta Massabó, Univ. of Genova), 2005.
50. Qiang Yu, *Size Effect and Design Safety in Concrete Structures under Shear*, 2007.
51. Jia-Liang Le, *Probabilistic and Energetic Scaling of Fracture of Quasibrittle Materials*, 2010.
52. Mahendra Gattu, *Structural Strength at Large Strains under Softening Compression Damage*, Aug. 2012.
53. Christian G. Hoover, *Fracture and size effect in quasibrittle composites: Experiment and theory*, Aug. 2012.
54. Kyung-Tae Kim, *Scaling of Failure and Time Dependent Behavior of Brittle Heterogeneous Materials: Composite, Concrete and Bone*, Sept. 2012.
55. Mija Helena Hubler, *Improved Prediction Models of Creep, Shrinkage, and Relaxation of Modern Concretes*, Aug. 2013.
56. Mohammed Gallal Alnaggar, *Multiscale modeling of aging and deterioration of reinforced concrete structures* (as co-advisor with principal advisor Prof. Gianluca Cusatis), Apr. 2014.
57. Kedar S. Kirane, *Fatigue, fracture and size effect in particulate and fabric composites: Constitutive modeling, theory and experiments*, Dec. 2014.

58. Viet Tuan Chau, *Fracture Mechanics in Anisotropic Quasi-brittle Material: Hydraulic Fractures in Shale, Damaging Composites*, June 2017.

2 M.S. Theses

1. Leonard J. Najjar, *The Drying of Concrete as a Nonlinear Diffusion Problem*, June 1971.

2. Werner Astl, *Torsion of Stiffening Systems of Thin-Walled Beams in High-rise Structures*, June 1976.

3. Michael C. Burrow, *Nonlinear Three-dimensional Finite Element Analysis of Reinforced Concrete Beams in Flexure*, August 1977.

4. Chuan Lin, *Frictional Limit Design of Reinforcement in Plates*, August 1981.

5. Steven Zebich, *Statistical Analysis of Creep and Shrinkage Data*, December 1981.

6. James S. Ong, *Creep in Continuous Beam Built Span by Span*, February 1982.

7. Warren J. Raftshol, *Finite Element Model for Creep and Shrinkage in Concrete Cylinders*, August 1982.

8. Kwang-Liang Liu, *Uncertainty Analysis and Shrinkage in Concrete Structures*, 1984.

9. Manuel Aguinaga-Zapata, *Effect of Creep on Overloads of Slab Buildings During Construction*, 1985.

10. Sohail Aslam, *Bayesian Probabilistic Prediction of Creep Deflections of Bridges*, 1985.

11. Hsu-Huei Sun, *Size Effect in Diagonal Shear Failure and Pullout Strength of Concrete*, 1986.

12. Hung-Wen Chen, *The Effect of Drying Creep in Concrete Box Girder Beams*, 1986.

13. Stephen Beissel, *Numerical Analysis of Nonlinear and Time-Dependent Fracture by Means of the Smeared-Tip Superposition Method*, 1990.

14. William F. Schell, *Fatigue Fracture of High Strength Concrete Under High Frequency Loading*, 1991.

15. Gustavo Gioia, *Is No-Tension Dam Design Always Safe?—A Comparison with Fracture Mechanics Analysis*, 1994.

16. Louis Paul Goncalves Da Costa, *Numerical*

Simulation of a Concrete Slab Impacted by a Projectile Using Microplane Theory and Finite Elements, 1995.

17. Michele Cyr, *Fracturing Truss Model: Size Effect of Reinforced Concrete Beams in Torsion*, 1998.

18. Guang-Hua Li, *Unbiased Statistical Evaluation of Creep and Shrinkage Models from a Comprehensive Database*, 2009.

Appendix I: Doctoral Theses Prepared Fully or Partly under Bažants Advisorship or Co-Advisorship at Northwestern, but Defended at Other Universities

1. Abu-Bakr Wahab *Stability of parallel crack system* (visiting, from U. of Khartoum).

2. Anping Hong, *Theory of Crack Initiation from Smooth Surfaces and Its Applications*, (co-advised with H. Binienda), 1994—Ph.D. awarded by University of Akron with Bažant as examining committee member.

3. Rodrigue Desmorat, *Size effect in fiber of bar pullout with interface softening slip*, Ph.D. Thesis, L.M.T., E.N.S. (Ecole National Supérieure) de Cachan, Paris-Cachan, France, 1992-93 (princ. advisor Jean Lemaitre); Visiting Research Assistant at Northwestern University.

4. Laurent Granger, *Effect of Composition on Basic Creep of Concrete and Cement Paste*, Ph.D. Thesis, E.C.P.C. (Ecole Nationale des Ponts et Chaussée), Paris, France, 1993 (princ. advisor Paul Acker); Visiting Research Assistant at Northwestern University.

5. Anders Boe Hauggaard, *Microprestress-Solidification Theory for Concrete Creep*, Ph.D. Thesis 1996, Technical University of Denmark, Lyngby, 1995 (prepared mainly at NU, supported by 6 month Danish Fellowship).

6. Jiří Nemeček, *Microplane modeling of concrete*, part of Ph.D. dissertation at CTU Prague (principal advisor Z. Bittnar).

7. Alexander Steffens, *Mathematical Model for Aggregate-Silica Reaction in Concrete*. Part of Ph.D. Thesis, T.U. Braunschweig, Germany 1999 (6 months at NU during 1998).

8. Gianluca Cusatis, *Microstructure Based Lattice Model for Concrete*, Ph.D. Thesis 2002, Politecnico di Milano, Italy (1 year at NU, 1999–2000, supported by Italian fellowship).

9. Giovanni de Luzio, *Nonlocal Microplane Model for Concrete* Ph.D. Thesis 2003, Politecnico di Milano, Italy (1 year at NU, 2000-2001, supported by Italian Fellowship).

10. Martin Wierer, *Computational Modeling of Composites* Predoctoral Fellow (doctoral student at CTU Prague, principal advisor J. Šejnoha), 4 months in 2003.

11. Miroslav Vořechovský, *Stochastic fracture mechanics and size effect* (doctoral student at VUT Brno), Ful-

bright Fellow, 8 months in 2003-04 (with supplement from Bažant's NSF grant).

Appendix II: Other Theses Prepared Fully or to a Major Extent under Bažant's Adversorship at Northwestern but Defended at Other Universities

1. M. Elisabeth (Betsy) Karr (M.S. Student on NU Summer Institute Fellowship), *Size effect in high strength concrete*, 1989.
2. Jérôme Pelan, *Inelastic buckling study of concrete columns*, Graduation Thesis at Ecole polytechnique, Paris-Palaiseau, France, Visiting Fellow at Northwestern University, spring 1992.
3. Marc Heitz, *A study of quasibrittle fracture*, Graduation Thesis at Ecole polytechnique, Paris-Palaiseau, France, Visiting Fellow at Northwestern university, spring 1992.
4. Phillipe Hein, *Finite element whose distribution function has an excess number of parameters determined by optimum fitting*. Graduation Thesis at Ecole polytechnique, Paris-Palaiseau, France, Visiting Fellow at Northwestern University, spring 1993.
5. Michael Thoma, *Size effect in pullout failure of fibers or reinforcing bars*, Diploma Thesis (Diplomarbeit, Lehrstuhl A für Mechanik), Technische Universität München, Germany; Visiting Research Assistant at Northwestern University, Dec. 1992-June 1993.
6. Olivier Barrère, *Fatigue fracture and size effect in fibre-reinforced concrete*, Thesis, E.N.S. de Cachan, France, 1996.
7. Louis da Costa, *Numerical simulation of impact on concrete walls*. Visiting Fellow (3 months at NU), from Ecole centrale, France, 1996.
8. Frédéric Beltoise. *Modeling of rapid heating of concrete wall*, princ. advisor for Ph.D. G. Pijaudier-Cabot, E.N.S. de Cachan, France, Visiting Fellow at NU, summer 1997.
9. Gianluca Cusatis (particle model for concrete with interface damage and fracturing, and extension of microprestress-solidification theory to variable temperature), princ. advisor Luigi Cedolin at Politecnico di Milano, 1-year 1998-1999 under grant from Italy.
10. Andreas Kalkbrenner, Predoctoral Fellow, graduate student on leave from Stuttgart University (Prof. H. Reinhardt), Visiting Fellow, Oct. 2001 - Jan. 2002.
11. Olivier Gouirand, Graduation Thesis at Ecole polytechnique, Paris-Palaiseau, France, Visiting Fellow, April-July 2004, Study of microplane model for fiber-reinforced concrete (support from France, plus supplement from Bažant's project).
12. Olivier Abellan, Graduation Thesis at Ecole polytechnique, Paris-Palaiseau, France, Visiting Fellow, Approximations of aging coefficient for concrete creep,

April-July 2005.

13. Pierre Madelpech, Graduation Thesis at Ecole polytechnique, Paris-Palaiseau, France, Visiting Fellow, Computer modeling of skin wrinkling in sandwich plates, April-July 2005.
14. Mathieu Verdure, Graduation Thesis at Ecole polytechnique, Paris-Palaiseau, France, Visiting Fellow, One-dimensional model for progressive collapse of tall buildings, April-July 2006.
15. Marc de Maréchal, Graduation Thesis at Ecole polytechnique, Paris-Palaiseau, France, Visiting Fellow, Size effect in punching shear of reinforced concrete slabs, April-July 2007.
16. Abdullah Dönmez, Istanbul Technical University, Size effect in punching shear and Interaction of drying and autogenous shrinkage, Apr. 2014-May 2015.
17. Cunbao Li, Sichuan University, Chendu, China (at NU Nov. 2015 - Sept. 2017). PhD in China in November 2017.

Appendix III: Theses at Other Universities Advised or Co-Advised by Bažant During His Visiting Appointments at These Universities

1. M. A. Mukaddam, *Creep analysis of concrete structures at elevated temperatures*, Ph.D. Dissertation, University of California, Berkeley, Ph.D., 1968 (princ. advisor Boris Bresler).
2. B.M. Jensen, *The effect of temperature on the thermal dilatation of concrete conditioned to a given humidity*, M.S. Thesis, 1968, University of California, Berkeley, 1968 (princ. advisor Boris Bresler).
3. Jan Byfors, *Concrete creep at early ages*, CBI, Royal Institute of Technology, Stockholm, Sweden, 1977 (co-advisor).
4. L. Resende, *Progressive damage continuum model for rock*, Ph.D. Dissertation, University of Cape Town, South Africa, 1984 (princ. advisor John B. Martin).
5. Jan Erik Jonasson, *Concrete Durability*, Ph.D., Lulea University, Sweden 1994 (also, principal examiner).

Appendix IV. Visiting Scholars and Postdoctoral Associates Supported Fully or Partly from Bažant's Projects

1. Geir Horrigmoe, Trondheim U.
2. Hideomi Ohtsubo (co-advisor: S. Nemat-Nasser)
3. Abu Bakr Wahab, Univ. of Khartoum, Sudan
4. R.P. Khetan (with Prof. Achenbach), India
5. Atilla Ansal, Bosphorus University, Istanbul
6. Luigi Cedolin, Politecnico di Milano
7. Pietro Gambarova, Politecnico di Milano
8. Zekai Celep, TU Istanbul

9. Henrik O. Madsen, Danish Eng. Acad., Lyngby
 10. Tong-Sheng Wang, Anhui, China
 11. David Darwin, U. of Kansas
 12. Andrej Pitoňák, ÚSTARCH, Slov .Ac. Sci. Bratislava
 13. Alexander Zubelewicz, IPPT, Warsaw
 14. Michael P. Wnuk, South Dakota State U.
 15. Soo-Gon Lee, Korea
 16. Patrick Droz, EFFL, Lausanne
 17. Jacky Mazars, ENS de Cachan, Paris
 18. Yves Berthaud, ENS de Cachan, Paris
 19. Joško Ožbolt, Stuttgart U. and Zagreb U.
 20. Jianying Pan, China Acad. of Railway Sci., Beijing
 21. Jose More Ramos, Lab. Nat. Engeh. Civil, Lisbon
 22. Mehmet Basar Çivelek, on leave from IIT Chicago
 23. Siddik Sener, Gazi U., Ankara
 24. Kang-Ming Xu, Wuhan Inst. Hydr.Elec.Engrg.
 25. Zhiping Cao, Yellow River Cons.Com., Zheng-Zhou
 26. Y.W. Kwon, Korea
 27. Toshiaki Hasegawa, Shimizu Co., Tokyo
 28. M. Elisabeth (Betsy) Karr
 29. Ignacio Carol, UPC, Barcelona
 30. Jaime Planas, UP Madrid
 31. Vladimír Křístek, CTU Prague
 32. Rodrigue Desmorat, ENS de Cachan, Paris
 33. Anders Boe Hauggaard, U. of Denmark, Lyngby
 34. Jaroslav Navrátil, TU Brno, Czech Rep.
 35. Richard Kohoutek, Univ. of Wollongong, Australia
 36. Jiří Nemeček, CTU Prague
 37. Borek Patzák, CTU Prague
 38. Jérôme Pelan, EP, Paris-Palaiseau
 39. Marc Heitz, EP, Paris-Palaiseau
 40. Jan L. Vitek, CTU Prague
 41. Stuart G. Reid, U. of Sydney
 42. Larissa Molina, CBI, Stockholm
 43. B. Pohl, EP, Paris-Palaiseau
 44. Phillipe Hein, EP, Paris-Palaiseau
 45. Michael Thoma, TU Munich, Germany
 46. Olivier Barrère, EP, Paris-Palaiseau
 47. Louis da Costa, EP, Paris-Palaiseau
 48. Frédéric Beltoise, EP, Paris-Palaiseau
 49. M. Verdure, EP, Paris-Palaiseau
 50. Shang-Ping Bai, Inst. of Sci. & Technol., Shanxi
 51. Min Chen, Water Conservancy Hydroel.Power Res.
 52. Imre Bojtár, TU Budapest
 53. Zhishen Wu, Kyoto University (later Nanjing)
 54. Laurent P. Granger, EDF, France
 55. Xiao-Xin Cui, Beijing Polytechnic Inst.
 56. Peter J. Simeovov, Bulgarian Acad. Sci., Sophia
 57. E. A. El Traify, Univ. of Khartoum, Sudan
 58. Wei Yi Gan, Northw. Invest./Design Inst., Xi'an
 59. Christian Huet, Ecole des Ponts et Chaussees, Paris
 60. Milan Holický, Klokner Inst., CTU (ČVUT), Prague
 61. Yuan-Neng Li, China
 62. An-Ping Hong, China
 63. Wei-Hwa Gu (co-advisor K. Faber)
 64. Bořek Patzák, CTU, Prague
 65. Franz-Josef Ulm, LCPC, Paris
 66. Alexander Steffens, Stuttgart University
 67. Gianluca Cusatis, Politecnico di Milano
 68. Giovanni de Luzio, Politecnico di Milano
 69. Jan Červenka, Červenka Co., Prague
 70. Petr Kabele, CTU, Prague
 71. Drahomír Novák, TU Brno, Czech Rep.
 72. Daniele Ferretti, U. of Parma, Italy
 73. Jan Sládek, Slovak Academy of Sciences, Bratislava
 74. Reza Vaziri, UBC, Vancouver
 75. Libor Jendele, Červenka Co., Prague
 76. Martin Wierer, CTU Prague
 77. Miroslav Vořechovský, TU Brno, Czech Rep.
 78. Arash Yavari, Caltech (as external collaborator)
 79. Petr Pařík, Czech Acad. Sci. Prague
 80. Ferhun Caner, UPC, Barcelona
 81. Peter Grassl, Chalmers U., Göteborg, Sweden
 82. Vít Šmilauer, CTU Prague
 83. Goangseup Zi, Korea University, Seoul
 84. Yun Lee, KAIST, Korea
 85. Jian-Ying Wu, Zhejiang Univ., Hangzhou, China
 86. Jan Eliáš, TU Brno, Czech Rep.
 87. Jörg Unger, BAM, Berlin
 88. Vanja Travaš, U. of Zagreb, Croatia
 89. Roman Wendner, BOKU, Vienna
 90. Jan Vorel, CTU, Prague
 91. Weihui Duan, Monash University, Melbourne
 92. Xin Chen, Univ. of Mining & Technology, Beijing
 93. An Duan, Zhejiang University, Hangzhou, China
 94. Petr Havlásek, Czech Technical University in Prague
 95. K Darunkumar Singh, IIT Guwahati, Assam, India
 96. Matthieu Vandamme, Université Paris Est
 97. Abdullah Dönmez, Istanbul Techn. University, Turkey
 98. Yewang Su, Tsinghua U. and National Academy of Sciences, Beijing
 99. Enrico Masoero, Univ. of Newcastle, U.K.
 100. Kedar Kirane, Exxon Corp., Houston, TX
 101. Zaoyang Guo, Prof., Beihang University, Beijing
 102. Mohammad Javad Abdolhosseini Qomi, Univ. of California, Irvine
 103. Marco Salviato (Univ. di Padova, Jan. 2013 - Aug. 2015, became Assist. Prof. U. of Washington, Seattle, Aero Dept.)
 104. Hoang Nguyen, Saigon (Ho Chi Min City), Vietnam-US Foundation (later became Bažant's PhD student)
 105. Cunbao Li, Sichuan University, Chengdu, China (Nov. 2015 - Sept. 2017)
 106. Weixin Li, postdoc, after a PhD at NU under Prof. Cusatis' advisorship
- Visiting Professors (partly or fully on ZPB grants):*
- Jaime Planas
 - Milan Jirásek (Eschbach Prof.)
 - Ferhun Caner
- Technicians** (paid from grants, since 1969):
 John Schmidt, Samuel Meiri, Marvin Hagen, Steve Albertson, John Chirayil, John Bayldon.