CURRICULUM VITAE

Kristian Krabbenhoft

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Personal Details

Date of Birth	17 January, 1973
Citizenship	Australian, Danish

Qualifications

MSc, Technical University of Denmark, 2000

PhD, Technical University of Denmark, 2003

Employment

02/2013 –	Founding Partner & CEO, Optum Computational Engineering
01/2011 – 12/2015	Future Fellow, Australian Research Council/University of Newcastle
09/2009 –	Professor (part time, continuing), University of Southern Denmark, Odense, Denmark
04/2009 –	Associate Professor (continuing), University of Newcastle, Australia
03/2007 – 03/2009	Senior Lecturer (continuing), University of Newcastle, Australia
01/2005 – 02/2007	Lecturer (contract), University of Newcastle, Australia
09/2003 – 12/2004	Research Academic (post-doc), University of Newcastle, Australia
08/2000 – 09/2003	Doctoral Candidate, Technical University of Denmark
02/1997 – 08/2000	Teaching Assistant, Technical University of Denmark

Visiting Appointments

11/2015 – 12/2015	Visiting Professor, Tsinghua University, Beijing, China
03/2015 – 03/2015	Visiting Scientist, Institut Français du Pétrole (IFP), Paris, France
04/2013 – 05/2013	Visiting Professor, Ecole Normale Superieure, Paris, France
02/2012 – 03/2012	Visiting Professor, University of Cergy-Pontoise, Paris, France
03/2008 – 06/2008	Visiting Researcher, Ecole Normale Superieure, Paris, France
12/2007 – 02/2008	Visiting Professor, Technical University of Denmark, Lyngby, Denmark
10/2006 – 12/2006	Visiting Researcher, Ecole Polytechnique, Paris, France

Research Funding

Personal Research Funding

2015-2017	Discovery Project (with George Kouretzis and Daichao Sheng). Australian Research Council Newcastle	$570,000
2015-2017	Discovery Indigenous (with Brett Turner and Greg Hanckock). Australian Research Council Newcastle	$463,900
2010-2014	Future Fellowship. Australian Research Council/University of Newcastle ($813,192/$203,298)	$1,016,490
2010-2013	Linkage Project (with Scott Sloan and 6 others). Australian Research Council/Hydro Aluminium ($580,000/$254,933)	$834,933
2010-2012	Discovery Project (Andrei Lyamin, Olivier Buzzi). Australian Research Council	$460,000
2009-2011	Discovery Project (with Andrei Lyamin). Australian Research Council	$300,000
2008-2011	Linkage Project (with Scott Sloan, Andrei Lyamin and five others) Australian Research Council/BHP Billiton ($390,000/$105,000)	$495,000
2008	Near Miss Grant (with Andrei Lyamin and Olivier Buzzi). University of Newcastle	$20,000
2008	Incentive Grant, University of Newcastle	$6,500
2008	Travel and Access Grant, Australian Microscopy and Microanalysis Research Facility (with Andrei Lyamin and Olivier Buzzi)	$1,880
2006-2008	Discovery Project (with Andrei Lyamin). Australian Research Council	$270,000
2006	Research Infrastructure Block Grant, University of Newcastle	$10,000
2006	Independent Investigator Project Grant, University of Newcastle	$6,753
2006	Incentive Grant, University of Newcastle	$2,000
2005	Travel Grant, University of Newcastle	$2,400
2005	Incentive Grant, University of Newcastle	$1,000
Total Personal Research Funding		**$4,460,856**

Collaborative Research Funding

2012	Linkage, Infrastructure, Equipment and Facilities Grant Australian Research Council (C. Gaudin and 16 others)	$700,000
2012	Linkage, Infrastructure, Equipment and Facilities Grant Australian Research Council (W. Gates and 15 others)	$500,000
2007-2011	Priority Research Center (Principal Researcher). University of Newcastle	$1,250,000
2011-2017	Centre of Excellence (Chief Investigator). Australian Research Council	$14,400,000
Total Collaborative Research Funding		**$16,850,000**

Teaching

Beams and Frames, Technical University of Denmark, 2000
Function: Tutor
Number of students: ~50
Topics covered: Elastic and plastic beams, elastic stability, finite elements.

Numerical Methods for Beams and Frames, Technical University of Denmark, 1998–2003
Function: Tutor and occasional lecturer
Number of students: ~20
Topics covered: Large displacements, plasticity, dynamics, and related numerical methods.

Constitutive Modeling and Material Nonlinearity, Technical University of Denmark, 2002
Function: Tutor and occasional lecturer
Number of students: ~10
Topics covered: Basic continuum mechanics, plasticity theory, fracture mechanics, finite elements and other numerical methods.

Geotechnical Design, University of Newcastle, 2004
Function: Tutor
Number of students: ~50
Topics covered: Practical geotechnical design project.

Geomechanics 1, University of Newcastle, 2004–2006
Function: Course coordinator (2004), lecturer, tutor
Number of students: ~110
Topics covered: Basic stress and strain analysis, soil classification, consolidation, shear strength, seepage, experimental techniques (theory and practice).

Geotechnical and Geoenvironmental Engineering, University of Newcastle, 2004–2007
Function: Course coordinator, lecturer, tutor
Number of students: ~55
Topics covered: Design and analysis of shallow and deep foundations, retaining systems, slope stability, site investigation, contamination transport and remediation techniques.

Introduction to Engineering Practice, University of Newcastle, 2007–2011
Function: Lecturer, tutor
Number of students: ~120
Topics covered: Role of engineers in society, ethics, design philosophy, codes of practice, project management, life cycle analysis, practical design project. Mentored team to reach National Grand Final, Melbourne, 2009 (3rd runner-up).

Advanced Geomechanics, University of Newcastle, 2008–2011
Function: Course coordinator, lecturer, tutor
Number of students: ~10
Topics covered: Plasticity theory, constitutive modeling, finite element analysis.

Awards and Honors

Doctoral Scholarship, Danish Research Academy, 2000–2003

Best Paper Award, 4th International PhD Symposium in Civil Engineering, Munich, Germany, 2002

Young Investigator Award, Asia-Pacific Association for Computational Mechanics, 2007.

Pro-Vice Chancellor's Award for Research Excellence, University of Newcastle, NSW, 2008.

Significant Paper Award, International Association for Computer Methods and Advances in Geomechanics, 2008.

Future Fellowship (2011-2015), Australian Research Council (only fellowship awarded in Civil Engineering in 2010).

Student Supervision and Mentoring

Josh Kautto (PhD)
Variational Methods for Elastoplasticity (06/2004–2006)

Mohamed Farooqi (PhD)
Virtual Testing of Geomaterials (04/2007–09/2011)

Khaled Al-Tarawneh (PhD)
Virtual Testing of Geomaterials (02/2007–08/2011)

Xue Zhang (PhD)
Granular Flows (08/2010–12/2014)

Qianqian Cai (PhD)
Removal of Flouride from Spent Pot Liners, (06/2012–present)

Pooyah Karambaksh (PhD)
Modelling of Cone Penetration Tests, (06/2012–present)

Johan Clausen (PhD, on leave from Aalborg University, Denmark, 05-07/2006)
Material Instabilities in Geomechanics

Mario Vicente da Silva (PhD, on leave from New University of Lisbon, Portugal, 07-09/2007)
Computational Limit Analysis

Hector Tinoco (PhD, on leave from University of Southern Denmark, 01/2010-12/2010)
Reinforced Concrete Plates

Jonas Jacobsen (PhD, on leave from Technical University of Denmark, 09-12/2011)
Fracture Mechanics

Zorah Irayani (PhD, on leave from University of Indonesia, 09-12/2012)
Renormalization for Permeability

Jeremy Bleyer (PhD, on leave from ENPC, Paris)
Shell Theory (01/2015–present)

Rezaul Kareem (Post-doc)
Variational Methods for Elastoplasticity, *Virtual Testing of Geomaterials* (10/2006–09/2011)

Jinsong Huang (Post-doc)
Virtual Testing of Geomaterials (09/2010–11/2011)

Andriy Kharechko (Post-doc)
Variational Methods in Plasticity (03/2011–03/2012)

Chet Vignes (Post-doc)
Computational Plasticity and Fracture Mechanics (08/2012–present)

Editorial Activities and Technical Committees

Member, Committee on Safety and Serviceability (TC205), International Society for Soil Mechanics and Geotechnical Engineering, 01/2011-present.

Corresponding Member, Committee on Numerical Methods in Geomechanics (TC103), International Society for Soil Mechanics and Geotechnical Engineering, 01/2015-present.

Member of Editorial Board, *Computers and Geotechnics (Elsevier)*, 05/2010-present

Publications

Theses

T1. Krabbenhoft K (2000). Limit Analysis of Plate Structures, MSc Thesis, Technical University of Denmark.

T2. Krabbenhoft K (2003). Moisture Transfer in Wood, PhD Thesis, Technical University of Denmark.

Book Chapters

B1. Krabbenhoft K, Hain M, Wriggers P (2007). Computation of effective cement paste diffusivities from microtomographic images, In: Kompis, V (editor): Composites with Micro-and Nano-Structure, Springer.

B2. Lyamin AV, Krabbenhøft K and Sloan SW (2010). Interface Modelling in Computational Limit Analysis. Recent Developments and Innovative Applications in Computational Mechanics, Chapter 36, Springer.

Journal Papers

J1. Krabbenhoft K, Damkilde L (2001). Electro-thermal device and circuit simulation with thermal nonlinearity due to temperature dependent diffusivity, *Electronics Letters*, 37, 1481-1482.

J2. Krabbenhoft K, Damkilde L (2002). Lower bound limit analysis of slabs with nonlinear yield criteria, *Computers and Structures*, 80, 2043-2057.

J3. Krabbenhoft K, Damkilde L (2003). A general nonlinear optimization algorithm for lower bound limit analysis, *International Journal for Numerical Methods in Engineering*, 56, 165-184.

J4. Krabbenhoft K, Damkilde L (2004). Finite element analysis of boron diffusion in wooden poles, *Wood and Fiber Science*, 36, 573-584.

J5. Krabbenhoft K, Damkilde L (2004). A model for non-Fickian moisture transfer in wood, *Materials and Structures*, 37, 615-622.

J6. Krabbenhoft K, Damkilde L (2004). Double porosity models for the description of water infiltration in wood, *Wood Science and Technology*, 38, 641-659.

J7. Krabbenhoft K, Damkilde L, Krabbenhoft S (2005). Ultimate limit state design of sheet pile walls using finite elements and nonlinear programming, *Computers and Structures*, 83, 383-393.

J8. Lyamin AV, Sloan SW, Krabbenhoft K, Hjiaj M (2005). Lower bound limit analysis with adaptive remeshing, *International Journal for Numerical Methods in Engineering*, 63, 1961-1974.

J9. Hjiaj M, Huang W, Krabbenhoft K, Sloan SW (2005). Formulation of non-standard dissipative behaviour of geomaterials, *Journal of Engineering Mathematics*, 52, 147-165.

J10. Krabbenhoft K, Lyamin AV, Hjiaj M, Sloan SW (2005). A new discontinuous upper bound limit analysis formulation, *International Journal for Numerical Methods in Engineering*, 63, 1069-1088.

J11. Krabbenhoft K, Damkilde L, Nazem M (2007). An implicit mixed enthalpy-temperature method for phase-change problems, *Heat and Mass Transfer*, 43, 233-241.

J12. Krabbenhoft K, Lyamin AV, Sloan SW, Wriggers (2007). P, An interior-point method for elastoplasticity, *International Journal for Numerical Methods in Engineering*, 69, 592-626.

J13. Leroy YM, Maillot B, Cubas N, Souloumiac P, Krabbenhoft K (2007). Selection of folding mechanisms based on the maximum rock strength, *Geophysical Research Abstracts*, 9, 03411.

J14. Souloumiac P, Leroy YM, Krabbenhoft K, Maillot B (2007). Predicting stress in fault-bend fold by optimization, *Geophysical Research Abstracts*, 9, 03377.

J15. Zhao J, Sheng D, Sloan SW, Krabbenhoft K (2007). Limit theorems for gradient-dependent elastoplastic geomaterials, *International Journal of Solids and Structures*, 44, 480-506.

J16. Krabbenhoft K, Lyamin AV, Sloan SW (2007). Bounds to shakedown loads for a class of deviatoric plasticity models, *Computational Mechanics*, 39, 879-888.

J17. Krabbenhoft K (2007). An alternative to primary variable switching in saturated-unsaturated flow computations, *Advances in Water Resources*, 30, 483-492.

J18. Krabbenhoft K, Lyamin AV, Sloan SW (2007). Formulation and solution of some plasticity problems as conic programs, *International Journal of Solids and Structures*, 44, 1533-1549.

J19. Krabbenhoft K, Lyamin AV, Sloan SW (2007). Shakedown of a cohesive-frictional half-space subjected to rolling and sliding contact, *International Journal of Solids and Structures*, 44, 3998-4008.

J20. Krabbenhoft K, Krabbenhoft J (2008). Application of the Poisson-Nernst-Planck equations to the migration test, *Cement and Concrete Research*, 38, 77-88.

J21. Krabbenhoft K, Lyamin AV, Sloan SW (2008). Three-dimensional Mohr-Coulomb plasticity using semidefinite programming, *Communications in Numerical Methods in Engineering*, 24, 1107-1119.

J22. Zhao JD, Sloan SW, Lyamin AV, Krabbenhoft K (2008). Bounds to shakedown of cohesive-frictional materials under moving surface loads, *International Journal of Solids and Structures*, 45, 3290-3312.

J23. Krabbenhoft K (2009). A variational principle of elastoplasticity and its application to the modeling of frictional materials, *International Journal of Solids and Structures*, 46, 464-479.

J24. Al-Tarawneh KK, Buzzi O, Krabbenhoft K, Lyamin AV (2009). Discussion of the paper: “Experimental Investigation…” by KP Nair et al., *Journal of Porous Media*, 12, 289-291.

J25. Souloumiac P, Leroy YM, Krabbenhoft K, Maillot B (2009). 3D stability of accretionary wedges by application of the maximum strength theorem, *Geophysical Research Abstracts*, 9, 03377.

J26. Al-Tarawneh KK, Buzzi O, Krabbenhoft K, Lyamin AV, Sloan SW (2009). An indirect correlation for permeability and diffusion coefficients, *Defects and Diffusion Forum*, 283-286, 504-514.

J27. Souloumiac P, Leroy YM, Krabbenhoft K, Maillot B (2009). Predicting stress distributions in fold-and-thrust belts and accretionary wedges by optimization, *Journal of Geophysical Research*, 114, B09404.

J28. Karim MR, Krabbenhoft K (2010). Extraction of effective transport properties of cement paste diffusivities from X-ray microtomography images, *Transport in Porous Media*, 84, 371-388.

J29. Karim MR, Krabbenhoft K (2010). New renormalization schemes for conductivity upscaling in heterogeneous media, *Transport in Porous Media*, 85, 677-690.

J30. Souloumiac P, Krabbenhoft K, Leroy YM, Maillot B (2010). Failure in accretionary wedges with the maximum strength theorem: numerical algorithm and 2D validation, *Computational Geosciences*, 14, 793-811.

J31. Krabbenhoft K, Lyamin AV (2012). Computational Cam clay plasticity using second-order cone programming, *Computer Methods in Applied Mechanics and Engineering*, 209-212, 239-249.

J32. Krabbenhoft S, Damkilde L (2012). Lower-bound calculations of the bearing capacity of eccentrically loaded footings in cohesionless soil, *Canadian Geotechnical Journal*, 49, 298-310.

J33. Krabbenhoft K, Karim MR, Lyamin AV, Sloan SW (2012). Associated computational plasticity schemes for nonassociated frictional materials, *International Journal for Numerical Methods in Engineering*, 90, 1087-1117.

J34. Krabbenhoft K, Lyamin AV, Huang J, Vicente da Silva M (2012). Granular contact dynamics using mathematical programming methods, *Computers and Geotechnics*, 43, 165-176.

J35. Krabbenhoft K, Huang J, Vicente da Silva M, Lyamin AV (2012). Granular contact dynamics with particle elasticity, *Granular Matter*, 14, 607-609.

J36. Huang J, Krabbenhoft K, Lyamin AV (2013). Statistical homogenization of elastic properties of cement paste based on X-ray microtomography images, *International Journal of Solids and Structures*, 50, 699-709.

J37. Huang J, Vicente da Silva M, Krabbenhoft K (2013). Three-dimensional granular contact dynamics with rolling resistance, *Computers and Geotechnics*, 49, 289-298.

J38. Karim MR, Oka F, Krabbenhoft K, Leroueil S, Kimoto S (2013). Simulation of long-term consolidation behaviour of soft sensitive clay using an elasto-viscoplastic constitutive model, *International Journal for Numerical and Analytical Methods in Geomechanics*, 37, 2801-2824.

J39. Jacobsen JS, Poulsen PN, Olesen JF, Krabbenhoft (2013). Constitutive mixed mode model for cracks in concrete, *Engineering Fracture Mechanics*, 99, 30-47.

J40. Sleap SB, Turner BD, Krabbenhoft K, Sloan SW (2013). Effects of pCO2 on the removal of fluoride from wastewater by calcite, *Journal of Environmental Engineering,* 139, 1053-1061.

J41. Huang J, Lyamin AV, Griffiths DV, Krabbenhoft K, Sloan SW (2013) Quantitative risk assessment of landslides by limit analysis and random fields, *Computers and Geotechnics*, 53, 60-67.

J42. Zhang X, Krabbenhoft K, Pedroso DM, Lyamin AV, Sheng D, Vicente da Silva M, Wang D (2013). Particle finite element analysis of large deformation and granular flow problems, *Computers and Geotechnics*, 53, 133-142.

J43. Lim KW, Krabbenhoft K, Andrade J (2013). Contact dynamics approach to the Granular Element Method, *Computer Methods in Applied Mechanics and Engineering*, 268, 557-573.

J44. Kardani O, Lyamin AV, Krabbenhoft K (2013). A comparative study of preconditioning techniques for large sparse systems arising in finite element limit analysis, *International Journal of Applied Mathematics*, 43, 195-203.

J45. Kardani O, Lyamin AV, Krabbenhoft K (2013). Iterative solution of large sparse systems arising from application of interior point methods in computational geomechanics, *Lecture Notes in Engineering and Computer Science*, 1, 216-221.

J46. Karim MR, Krabbenhoft (2014). Permeability determination of porous media using large-scale finite element analysis, *International Journal for Numerical Methods and Analytical Methods in Geomechanics*, 38, 991-1012.

J47. Lim KW, Krabbenhoft K, Andrade J (2014). A contact dynamics approach to the Granular Element Method, *Computer Methods in Applied Mechanics and Engineering*, 268, 557-573.

J48. Lim KW, Krabbenhoft K, Andrade J (2014). On the treatment of non-convex particles in the granular element method, *Computational Particle Mechanics*, 1, 257-275

J49. Zhang X, Krabbenhoft K, Sheng D (2014). Particle finite element analysis of the granular column collapse problem, *Granular Matter*, 16, 609-619.

J50. Huang J, Krabbenhoft K, Lyamin AV (2014). Simulating granular column collapse by non-smooth contact dynamics, *Blucher Mechanical Engineering Proceedings*, 1, 1541-1547.

J51. Kouretzis G, Krabbenhoft K, Sheng D, Sloan S (2014). Soil-buried pipeline interaction for vertical downwards relative offset, *Canadian Geotechnical Journal*, 51, 1087-1094.

J52. Zhang X, Krabbenhoft K, Sheng D (2014). Particle finite element simulation of granular media, *Applied Mechanics and Materials*, 553, 410-415.

J53. Huang J, Griffiths DV, Lyamin AV, Krabbenhoft K, Sloan SW (2014). Discretization errors of random fields in finite element analysis, *Applied Mechanics and Materials*, 553, 405-409.

J54. Zhang X, Krabbenhoft K, Sheng D, Li W (2015). Numerical simulation of flow-like landslide using the particle finite element method, *Computational Mechanics*, 55, 167-177.

J55. Kardani O, Lyamin AV, Krabbenhoft K (2015). Application of GPU accelerated hybrid preconditioned conjugate gradient approach for large 3D problems in computational geomechanics, *Computers and Mathematics with Applications*, 69, 1114-1131

J56. Zhang X, Sheng D, Kouretzis G, Krabbenhoft K, Sloan SW (2015). Numerical investigation of the cylinder movement in granular matter, *Physical Review E*, 91, 022204.

J57. Krabbenhoft K, Lyamin AV (2015). Strength reduction finite element analysis, *Geotechnique Letters*, 5, 205-253.

J58. Krabbenhoft K, Lyamin AV (2015). Generalized Tresca criterion for total stress undrained analysis, *Geotechnique Letters*, 5, 313-317.

J60. Zhang X, Sheng D, Sloan SW, Krabbenhoft K (2016). Second-order cone programming formulation for consolidation analysis of saturated porous media, *Computational Mechanics*, 58, 29-43.

Conference papers

72 conference papers between 2001 and 2016 at leading international conferences including WCCM, ECCOMAS, ECCM, ICTAM, NUMOG, COMGEO, NUMGE, IACMAG, and COMPLAS.

Reviewing Activities

Research Funding Organizations

Australian Research Council (DP, LP, FT)

Journals

Acta Geotechnica
Asia-Pacific Journal of Chemical Engineering
Canadian Geotechnical Journal
Communications in Numerical Methods in Engineering
Computational and Applied Mathematics
Computational Mechanics
Computer Methods in Applied Mechanics and Engineering
Computers and Geotechnics
Computers and Structures
Engineering Structures
Engineering Geology
Geotechnique
Geotechnique Letters
Holtzforschung
International Journal of Mechanical Sciences
International Journal of Nonlinear Mechanics
International Journal for Numerical Methods in Engineering
International Journal for Numerical and Analytical Methods in Geomechanics
International Journal of Rock Mechanics and Mining Sciences
International Journal of Solids and Structures
Journal of Applied Geophysics
Journal of Engineering Mechanics-ASCE

Journal of the Mechanics and Physics of Solids
Journal of Structural Engineering-ASCE
Journal of Tropical Forest Science
Materials and Structures
Optimization and Engineering
Proceedings of the Royal Society A
Structural Engineering and Mechanics
Transport in Porous Media
Wood and Fiber Science