Bodhinanda (Nanda) Chandra Ph.D.

6124 ABCD Etcheverry Hall, University of California, Berkeley, CA 94720, USA
Nationality: Indonesian, Telephone: (+1) (510) 570-7235, Email: bchandra@berkeley.edu
Webpage: https://bodhinandach.github.io/
LinkedIn: http://linkedin.com/in/bodhinandach
ORCID: 0000-0003-2537-8213

EDUCATION

University of California, Berkeley, United States
Doctor of Philosophy in Civil Engineering with a Designated Emphasis in Computational and Data Science and Engineering, Aug. 2019 – May 2024, GPA: 4.0/4.0

Dissertation:	Stabilized Material Point Method for Hydro-Mechanical Coupled Problems in Geomechanics
Major:	Geomechanics and GeoSystems Engineering
Minors:	Mechanics of Solids, Fluid Mechanics
Advisor:	Prof. Kenichi Soga

Technical University of Munich, Germany
Master of Science with Honours in Computational Mechanics, Oct. 2016 – April 2019, GPA: 1.2/1.0

Thesis:	Soil-structure interaction simulation using a coupled implicit Material Point - Finite Element Method: An emphasis on the dynamic interaction of landslides and protection structures
Advisors:	Prof. Roland Wüchner, Prof. Antonia Larese

Kyushu University, Fukuoka, Japan
Bachelor of Engineering in Civil Engineering, Oct. 2012 – Sept. 2016, GPA: 3.9/4.0

Thesis:	Fluid-structure interaction formulation to simulate bridge wash-out phenomena during tsunami by using a stabilized incompressible Smoothed Particle Hydrodynamics (ISPH) Method
Advisor:	Prof. Mitsuteru Asai

EMPLOYMENT

Postdoctoral Researcher Jun. 2024 - Present
Dept. of Mechanical Engineering, University of California, Berkeley, Advisor: Ken Kamrin

Graduate Student Researcher Aug. 2019 – May 2024
Dept. of Civil and Env. Engineering, University of California, Berkeley, Advisor: Kenichi Soga

Graduate Research Assistant Oct. 2018 – Apr. 2019
Chair of Structural Analysis, Technical University of Munich, Advisor: Roland Wüchner

Part-time Research Engineer Jul. 2017 – Feb. 2018
BMW Research and Innovation Center, BMW Group, Munich, Germany

Engineering Intern Aug. – Sept. 2014
VINCI Construction Grands Projets, Jakarta, Indonesia

Engineering Intern Feb. – Mar. 2014
Soletanche Bachy, Singapore

VISITING APPOINTMENT

Visiting Researcher Jun. – Aug. 2019
Dept. of Mathematics, University of Padova, Advisor: Antonia Larese

Research Intern Aug. – Sept. 2018
School of Civil and Env. Engineering, University of New South Wales, Advisor: Arman Khosghalb

Visiting Researcher Jun. – Jul. 2018
Structural Analysis Laboratory, Kyushu University, Advisor: Mitsuteru Asai

Research Intern Mar. – May 2018
Int. Center for Numerical Methods in Engineering (CIMNE), Barcelona, Advisors: Antonia Larese, Riccardo Rossi

TEACHING

Graduate Student Instructor — Dept. of Civil and Env. Engineering, University of California, Berkeley

- Course: Numerical Modelling in Geomechanics (CE 272) — Spring 2021, 2024
  Lead: Prof. Kenichi Soga
- Course: Advanced Geomechanics (CE 270) — Fall 2021
  Lead: Prof. Adda Athanasopoulos-Zekkos

Teaching Assistant — Dept. of Civil, Geo and Env. Engineering, Technical University of Munich

- Course: Computational Material Modeling 1 (BV330009) — Winter 2017 – 2018
  Lead: Prof. Fabian Duddeck
- Course: Advanced Fluid Mechanics (BGU41021) — Winter 2017 – 2018
  Lead: Prof. Michael Manhart
- Course: Explicit Finite Element Methods and Transient Analysis (BV330008) — Summer 2017
  Lead: Prof. Fabian Duddeck

Undergraduate Teaching Assistant — Dept. of Earth Resources, Marine and Civil Eng., Kyushu University
Course: Introduction to Information Processing — Spring 2016
Lead: Prof. Mitsuteru Asai

Academic Tutor — Faculty of Arts and Science, Kyushu University
Course: Fundamentals of Mechanics and Exercises A — Fall 2013 – 2014
Lead: Prof. Hemanta Hazarika

RESEARCH MENTORING

Ph.D.

1. S. Matsumi (Hiroshima University, ongoing, PI: Prof. R. Hashimoto) – "Fluid-solid interaction of river levee systems".
2. C. Geudeker (UC Berkeley, ongoing, PI: Prof. K. Soga) – "Modeling earthquake-induced landslides with MPM".
3. L. Talbot (UC Berkeley, ongoing, PI: Prof. K. Soga) – "MPM for large-scale mass motion modeling".

MS

1. V. D. Adinda (UC Berkeley, Spring 2023, PI: Prof. K. Soga) – "Enhancing scientific visualization in MPM".
2. L. Talbot (UC Berkeley, Spring 2022, PI: Prof. K. Soga) – "3D linear tetrahedron element in MPM".

PUBLICATION AND PRESENTATION

Under Review

1. J. Kurima, **B. Chandra**, K. Soga. "Absorbing boundary conditions in material point method adopting perfectly matched layer theory." *Under review*, Jul. 2024. (*Preprint*)

Journal Articles

1. **B. Chandra**, R. Hashimoto, K. Kamrin, K. Soga. "Mixed material point method formulation, stabilization, and validation for unified analysis of free-surface and seepage flow." *Journal of Computational Physics*, 2024, doi: 10.1016/j.jcp.2024.113457.
2. **B. Chandra**, R. Hashimoto, S. Matsumi, K. Kamrin, K. Soga. "Stabilized mixed material point method for incompressible fluid flow analysis." *Computer Methods in Applied Mechanics and Engineering*, 2024, doi: 10.1016/j.cma.2023.116644.
3. M. Molinos, **B. Chandra**, M. M. Stickle, K. Soga. "On the derivation of a component-free scheme for Lagrangian fluid-structure interaction problems." *Acta Mechanica*, 2023, doi: 10.1007/s00707-022-03459-1.
4. Y. Liang, **B. Chandra**, K. Soga. "Shear band evolution and post-failure simulation by the extended material point method (XMPM) with localization detection and frictional self-contact." *Computer Methods in Applied Mechanics and Engineering*, 2022, doi: 10.1016/j.cma.2021.114530.
5. S. Kularathna, W. Liang, T. Zhao, **B. Chandra**, J. Zhao, K. Soga. "A semi-implicit material point method based on fractional-step method for saturated soil." *Int. Journal for Numerical and Analytical Methods in Geomechanics*, 2021, doi: 10.1002/nag.3207.
6. M. Asai, L. Yi, **B. Chandra**, S. Takase. "Fluid–rigid-body interaction simulations and validations using a coupled stabilized ISPH-DEM incorporated with the energy-tracking impulse method for multiple-body contacts." *Computer Methods in Applied Mechanics and Engineering*, 2021, doi: 10.1016/j.cma.2021.113681.

7. **B. Chandra**, V. Singer, T. Teschemacher, R. Wüchner, A. Larese. "Nonconforming Dirichlet boundary conditions in implicit material point method by means of penalty augmentation." *Acta Geotechnica*, 2021, doi: 10.1007/s11440-020-01123-3.

8. L. Yi, M. Asai, **B. Chandra**, M. Isshiki. "Energy-tracking impulse method for particle-discretized rigid-body simulations with frictional contact." *Computational Particle Mechanics*, 2020, doi: 10.1007/s40571-020-00326-5.

Book Chapters

1. A. Larese, I. Iaconeta, **B. Chandra**, V. Singer. "Implicit MPM and coupled MPM-FEM in geomechanics." *ALERT Doctoral School 2020: Point based numerical methods in geomechanics (2020)*, pp.153-188.

Conference Proceedings (peer-reviewed)

1. **B. Chandra**, R. Hashimoto, M. Molinos, K. Soga. "High-performance, high-order implicit high-order material point method for progressive levee failure simulations". *Geo-Congress 2023*, Mar. 2023.

2. **B. Chandra**, T. Zhao, S. Kularathna, K. Soga. "Accurate high-performance fluid-soil interaction modeling and simulation using a projection-based Material Point Method". *Geo-Congress 2022*, Mar. 2022.

3. J. Given, S. Kularathna, E. Y. Tjung, **B. Chandra**, K. Soga, H. Wang, S. Morgan, H. A. Meier, J. L. Garzon. "Modeling wellbore erosion using standard and Cut-Mesh approaches in Material Point Method". *Geo-Congress 2022*, Mar. 2022.

4. V. Singer, **B. Chandra**, R. Wüchner, A. Larese. "A staggered coupling scheme of the Material Point Method and the Finite Element Method using Gauss Seidel communication pattern". *IX International Conference on Coupled Problems in Science and Engineering (COUPLED 2021)*, Jul. 2021.

5. A. Larese, F. Salazar, R. Rossi, E. Oñate, **B. Chandra**, R. Wüchner. "Computational models for the simulation of extreme environmental flows." *2nd International Conference on Natural Hazards & Infrastructure (ICONHIC 2019)*, Jun. 2019.

6. **B. Chandra**, A. Larese, P. Bucher, R. Wüchner. "Coupled soil-structure interaction modeling and simulation of landslide protective structures." *VIII International Conference on Coupled Problems in Science and Engineering (COUPLED 2019)*, Jun. 2019.

7. **B. Chandra**, A. Larese, I. Iaconeta, R. Rossi, R. Wüchner. "Soil-structure interaction simulation of landslides impacting a structure using an implicit material point method." *2nd International Conference on The Material Point Method for Modelling Soil-Water-Structure Interaction (MPM 2019)*, Jan. 2019.

8. M. Asai and **B. Chandra**. "Numerical prediction of bridge wash-out during natural disaster by using a stabilized ISPH method." *The 2016 World Congress on Advances in Civil, Environmental, and Material Research (ACEM16)*, Aug. 2016.

9. **B. Chandra**, M. Asai, and T. Oya. "A study of bridge wash-out simulation during tsunami using a particle method considering frictional contact." *16th International Conference on Computing in Civil and Building Engineering (ICCCBE 2016)*, Jul. 2016.

10. **B. Chandra** and M. Asai. "Verification and validation of the fluid-rigid body interaction simulation by the smoothed particle hydrodynamics method." *Proceedings of the Conference on Computational Engineering and Science Vol. 21*, May 2016.

Presentations (excluding above proceedings)

1. **B. Chandra**, R. Hashimoto, K. Kamrin, K. Soga. "Verification and validation of stabilized mixed material point method for simulations of coupled free-surface and porous-media flow." *The 15th Annual MPM Workshop*, Sept. 2024.

2. **B. Chandra**, R. Hashimoto, K. Kamrin, K. Soga. "Development of mixed material point method for analysis of free-surface and seepage flow." *16th World Congress on Computational Mechanics*, Jul. 2024.

3. **B. Chandra**, R. Hashimoto, S. Matsumi, K. Kamrin, K. Soga. "Development of stabilized mixed material point method for incompressible fluid flow analysis: formulation and validation." *The 14th Annual MPM Workshop*, Sept. 2023.

4. **B. Chandra**, K. Soga. "Improving the accuracy and efficiency of hydro-mechanical coupled MPM in modeling small and large deformation geomechanical problems." *The 13th Annual MPM Workshop*, Sept. 2022.

5. **B. Chandra**, K. Kamrin, K. Soga. "Accurate and efficient hydro-mechanical coupled MPM and its application in modeling small and large deformation geomechanics." *19th US National Congress on Theoretical and Applied Mechanics (USNC-TAM)*, Jun. 2022.

6. **B. Chandra**, K. Soga. "A semi-implicit material point method for simulation of fluid-soil interaction considering high-performance computing" *VII International Conference on Particle-Based Methods (PARTICLES 2021)*, Oct. 2021.

7. **B. Chandra** and M. Asai. "A study of bridge wash-out simulation during tsunami by using the smoothed particle hydrodynamics (SPH) method." *JSCE 18th International Summer Symposium*, Sept. 2016.

8. **B. Chandra** and M. Asai. "A study of bridge wash out simulation during tsunami using the smoothed particle hydrodynamics (SPH) method." *International Conference for Undergraduate Research (ICUR) 2015*, Sept. 2015.

Invited Talks

1. **B. Chandra**. "Computational mechanics for natural hazards modeling." *Webinar for the Indonesian Civil Engineers' Society of North America*, Sept. 2024.
2. **B. Chandra**, K. Kamrin, K. Soga. "Improving accuracy and efficiency in material point method (MPM) for both single and multi-phase continua." 6^{th} *GeoSystems Engineering Annual Research Symposium - Keynote presentation*, Nov. 2022.
3. **B. Chandra**. "Natural disaster simulation by particle methods." *CIMNE Coffee Talk*, May 2018.

SERVICE ROLES AND OTHER ACTIVITIES

Review Activities

- Reviewed articles for: Computer Methods in Applied Mechanics and Engineering, Journal of Geotechnical and Geoenvironmental Engineering, Journal of Soils and Foundations, Mathematics, Int. Journal of Environmental Research

Conference Organizing

- The 15th Annual MPM Workshop, Berkeley (Role: Lead Organizer) — Sep. 2024

Academic and Scientific Activities

- Argonne Training Program on Extreme-scale Computing — Jul. 2024
- International HPC Summer School — Jul. 2021
- Elite Network of Bavaria — Apr. 2017 – 2019
- Bavarian Graduate School of Computational Engineering — Apr. 2017 – 2019
- Oskar von Miller Forum — Apr. 2017 – 2019
- Advanced Technology Higher Education (ATHENS) Network — Nov. 2017, 2018
- Center for Asia-Pacific Future Studies, Kyushu University — Nov. 2014 – Apr. 2016
- Japan-UK Research and Education Network for Knowledge Economy Initiatives (RENKEI) — Aug. 2015

Professional Affiliations

- Int./US Assoc. of Computational Mechanics (IACM/USACM), American Society of Civil Engineers (ASCE), Indonesian Civil Engineers' Society of North America (ICESNA), Int. Assoc. for Computer Methods and Advances in Geomechanics (IACMAG), Society for Industrial and Applied Mathematics (SIAM), German Assoc. of Computational Mechanics (GACM), Japan Society of Civil Engineers (JSCE)

Leadership and Committee Roles

- United States Association for Computational Mechanics at Berkeley — Aug. 2024 – Ongoing
- Indonesian Civil Engineers' Society of North America (ICESNA) — Jan. 2023 – Ongoing
- UC Berkeley Dept. of Civil and Env. Eng. Graduate Studies Committee — Sep. 2022 – May 2024
- PERMIAS Nasional (Indonesian Students Association in the United States) — Aug. 2021 – July 2022
- GeoEngineering Graduate Student Association at Berkeley — Aug. 2020 – May 2022
- Civil and Environmental Engineering Graduate Student Society (CEE GSS) — Jan. 2020 – May 2022
- Student Committee for the Internationalization of Kyushu University (SCIKyu) — Nov. 2013 – Apr. 2016
- Kyushu University Foreign Student Association (KUFSA) — Apr. 2014 – Mar. 2016
- Kyushu University International Undergraduate Program Student Union — Oct. 2014 – Mar. 2016
- Indonesian Student Association in Fukuoka — Apr. 2013 – Mar. 2015

Voluntary Activities

- Indonesia Mengglobal Mentorship Program — Jul. – Dec. 2021
- Tanoto Foundation Career Mentoring Program — Apr. – Dec. 2021

TECHNICAL SKILLS

- Languages: Indonesian (native), English (fluent), Japanese (fluent), and German (basic)
- Programming: C++, C, Matlab, Python, Fortran, parallel programming (OpenMP, MPI)
- CAE and CAD softwares: OpenFOAM, Abaqus, Ansys, Plaxis, GeoStudio, ParaView, GiD
- Fluent in Git- and Unix-based syntax
- Other softwares: LaTeX, Microsoft Office, Adobe Photoshop Suites

GRANTS AND AWARDS

Research Grants

- ALCF Polaris Startup Allocations (PI) — Aug. 2024 - Apr. 2025
- TACC Frontera Startup Allocations (Co-investigator) — Feb. 2024 - Feb. 2025

Awards

- Top cited paper, Int. Journal for Numerical and Analytical Methods in Geomechanics — 2022
- TUM Dept. of Civil, Geo, and Env. Engineering — SOFiSTiK Prize 2019 — Jul. 2019
- JSCE 18th International Summer Symposium — Excellence Presentation Award — Nov. 2016
- International Conference for Undergraduate Research — Award of Excellence — Dec. 2015

Scholarships and Fellowships

- USACM Travel Award — Jul. 2024
- UC Berkeley Graduate Division Conference Travel Grant — Jan. 2020, Jun. 2022
- Jane Lewis Fellowship — Aug. 2020, 2021
- Erasmus+ (Graduate) Internship Grant — Mar. 2018, Jun. 2019
- Excellence Initiative Scholarship of Oskar von Miller Forum — Apr. 2017 – 2019
- UNSW School of Civil and Environmental Engineering Research Practicum Scholarship — Aug. 2018
- Oskar Karl Forster Scholarship for Books and Learning Materials — Jun. 2018
- Deutscher Akademischer Austauschdienst (DAAD) Study Scholarship — Oct. 2017, 2018
- Kobayashi International Scholarship — Apr. 2016
- Japanese Government Monbukagakusho Scholarship — Sept. 2012, Apr. 2015
- Tanoto Foundation Sayap Garuda Scholarship — Mar. 2015
- Kyudenko Scholarship — Apr. 2014
- Kyushu University International Undergraduate Scholarship — Apr. 2013, 2014