Debanjan Mukherjee, Ph.D.

Contact Information

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Research Interests

- Computational: Computational fluid dynamics and transport processes; Fluid-particle and Fluid-structure interaction; Multiscale modeling; Finite element method; Discrete element method; Molecular Dynamics; High-performance computing.
- Biomedical: Image-based modeling for biofluids and biomechanics; Hemodynamics and vascular transport processes; Cerebro-vascular flow; Biomechanics of cardiovascular diseases - stroke, thrombosis, embolisms; Cardiovascular biomedical device design; Drug delivery.
- Industrial: Particle-based manufacturing processes; Powder spreading and transport in additive manufacturing; Design of particulate/particle-based materials; Multi-phase and particle-laden flows in industrial processes; Granular flows/dynamics.
- Other: Collective dynamics of particle systems; Statistical physics of particle dynamics and transport.

Education

University of California, Berkeley - California, USA

Ph.D., Mechanical Engineering, December 2013

- Dissertation: *Discrete Particle Simulation Techniques For The Analysis Of Colliding And Flowing Particulate Media*
- Advisor: Prof. Tarek I. Zohdi

M.S., Mechanical Engineering, May 2010

- Thesis: *Computational Design & Modeling Of The Dynamics Of Floating Ocean Wave Energy Converters*
- Advisor: Prof. Alaa E. Mansour

Indian Institute of Technology, Madras - Tamil Nadu, India

B.Tech, Ocean Engineering, July 2008

- Thesis: *CFD Simulations Of Wave Resistance On Twin-Hull Catamarans*
- Advisor: Prof. P. Krishnankutty

Professional Experience

Assistant Professor *January, 2019 - present*
Department of Mechanical Engineering, University of Colorado, Boulder

Visiting Assistant Professor *August, 2018 - January, 2019*
Department of Mechanical Engineering, University of Colorado, Boulder

Post-doctoral Fellow: Cardiovascular fluid mechanics *January, 2014 - July, 2018*
Department of Mechanical Engineering, University of California, Berkeley
Supervisor: Prof. Shawn C. Shadden

Assistant Specialist Researcher: Magnetic particle flows *September, 2013 - January, 2014*
Department of Mechanical Engineering, University of California, Berkeley
Supervisor: Prof. Tarek I. Zohdi

Funding Experience

1. American Heart Association Post-doctoral Fellowship, 2015
   - Award Number: 16POST27500023; Award Amount: $90,000
2. Burroughs Wellcome Fund Collaborative Research Travel Grant (CRTG), 2016
   - Award Number: 1016360; Award Amount: $5,240
3. NSF-CMMI Conference Support Grant, 2016 (co-written with P. Rangamani, and J. C. del Alamo).
   - Award Number: 1642312; Award Amount: $12,320

Awards & Honors

1. Journal Cover Feature: August 2018 issue of Annals of Biomedical Engineering for publication "The Role Of Circle of Willis Anatomy in Cardio-embolic Stroke-A Patient-specific Simulation Based Study".
2. Best Poster Award: 5th International Conference on Engineering Frontiers in Pediatric and Congenital Heart Disease, 2016 (3rd place in Young Investigator Competition).
3. Best Poster Award: Society of Petroleum Engineers (SPE) International Oilfield Corrosion Conference and Exhibition, 2014.
4. Selected as Institute Fellow for the *'Summer Institute for Preparing Future Faculty'* by the Graduate Division, U.C. Berkeley, Summer 2013.
5. Outstanding Graduate Student Instructor Award: Graduate Introduction to Finite Element Analysis, Fall 2011.
6. Best Paper Award: 29th International Conference on Ocean & Offshore, and Arctic Engineering, 2010.
7. Outreach for Engineers Specialty Forum Scholarship by ASME-IPTI for the International Conference on Ocean & Offshore, and Arctic Engineering, 2010.
8. Allen D. Wilson Memorial Scholarship by the Department of Mechanical Engineering, U.C. Berkeley, Spring 2010.
9. Renewable Energy Scholarship Award by the Berkeley Energy & Resources Collaborative (BERC), Spring 2010.
10. Block Grant Award by the Department of Mechanical Engineering, U.C. Berkeley, Summer 2009.
11. Student delegate at the *'CSIR Programme for Youth Leadership in Science 2002'* by the Council of Scientific and Industrial Research (CSIR), Government of India.

Journal Articles

1. **Mukherjee, D.**, Jani, N.D., Narvid, J., and Shadden, S.C. (2018). The Role Of Circle of Willis Anatomy In Cardio-embolic Stroke - A Patient-specific Simulation Based Study. *Annals of Biomedical Engineering.* 46(8):1128-1145. [*pre-print:* `bioRxiv-190579`].
2. **Mukherjee, D.**, and Shadden, S.C. (2018). Modeling Blood Flow Around A Thrombus Using A Hybrid Particle-Continuum Approach. *Biomechanics and Modeling in Mechanobiology.* 17(3):645-663.
3. **Mukherjee, D.**, and Shadden, S.C. (2017). Inertial Particle Dynamics In Large Artery Flows - Implications For Modeling Arterial Embolisms. *Journal of Biomechanics.* 52(8):155-164.
4. Casas, G.*, **Mukherjee, D.***, Celigueta, M.A., Zohdi, T.I., and Onate, E. (2017). A Modular, Partitioned, Discrete Element Framework For Industrial Grain Distribution Systems With Rotating Machinery. *Journal of Computational Particle Mechanics.* 4(2):181-198.
5. **Mukherjee, D.**, Jani, N., Selvaganesan, K., Weng, C.L., and Shadden, S.C. (2016). Computational Assessment Of The Relation Between Embolism Source And Embolus Distribution To The Circle Of Willis For Improved Understanding Of Stroke Etiology. *Journal of Biomechanical Engineering.* 138(8):081008-081008-13.
6. **Mukherjee, D.**, Padilla, J., and Shadden, S.C. (2015). Numerical Investigation Of Fluid-particle Interactions For Embolic Stroke. *Theoretical and Computational Fluid Dynamics.* 30(1):23-39.

7. **Mukherjee, D.**, and Zohdi, T.I. (2015). A Discrete Element Based Simulation Framework To Investigate Particulate Spray Deposition Processes. *Journal of Computational Physics*, 290:298-317.
8. **Mukherjee, D.**, and Zohdi, T. I. (2015). Computational Modeling Of The Dynamics & Interference Effects Of An Erosive Granular Jet Impacting A Porous, Compliant Surface. *Granular Matter* 17(2):231-252.
9. **Mukherjee, D.**, Zaky, Z., Zohdi, T.I., Salama, A., and Sun, S. (2015). Investigation Of Guided Particle Transport For Noninvasive Healing Of Damaged Piping System Using Electro-Magneto-Mechanical Methods. *Journal of Society of Petroleum Engineers* 20(4):872-883.
10. **Mukherjee, D.**, and Zohdi, T. I. (2014). Electromagnetic Control Of Charged Particulate Spray Systems - Models For Planning The Spray-gun Operations. *Computer-Aided Design*, 46:211-215.

(indicates that authors contributed equally)*

Peer-reviewed Proceedings

1. **Mukherjee, D.**, and Shadden, S.C. (2017). Fictitious Domain Particle-Based Modeling For Thrombosis. *Proceedings of the Summer Biomechanics, Bioengineering, and Biotransport Conference, Tucson, Arizona.*
2. **Mukherjee, D.**, Jani, N.D., and Shadden, S.C. (2017). Discrete Particle Modeling For Thrombotic And Embolic Phenomena In Arteries. *Proceedings of the 5th International Conference on Computational and Mathematical Biomedical Engineering, Pittsburgh, Pennsylvania.*
3. **Mukherjee, D.**, and Shadden, S.C. (2016). Towards Non-invasive, Computational Modeling Of The Transport Of Thrombo-Emboli And Athero-Emboli Along Arteries. *Proceedings of the Summer Biomechanics, Bioengineering and Biotransport Conference, National Harbor, Maryland.*
4. **Mukherjee, D.**, and Shadden, S.C. (2015). Insights Into The Hemodynamic Factors Affecting Embolus Transport For Stroke. *Proceedings of the Summer Biomechanics, Bioengineering and Biotransport Conference, Snowbird, Utah.*
5. **Mukherjee, D.**, and Zohdi, T.I. (2013). Computer Modeling and Simulation Framework for Particulate Spray Based Manufacturing Processes. *Proceedings of the ASME International Mechanical Engineering Congress & Exposition, San Diego, California.*
6. **Mukherjee, D.**, and Mansour, A.E. (2010). Preliminary Concept and Feasibility Studies on Ocean Energy Device Design from Used Ships. *Proceedings of the 29th International Conference on Ocean & Offshore, and Arctic Engineering, Shanghai, China.* - **[best paper award]**

Articles in preparation

1. **Mukherjee, D.**, Diamond, S.L., and Shadden, S.C. Modeling Flow-mediated Transport In The Neighborhood Of Blood Clots.
2. **Mukherjee, D.**, and Zohdi, T.I. A Monte-Carlo Based Framework For Uncertainty Characterization And Durability Estimation For A Material Layer Impacted By A Particle.
3. **Mukherjee, D.**, and Zohdi, T.I. An Iterative Collide-and-stream Algorithm For Particle Ensembles With Non-Enduring Contacts.

Abstracts & Presentations

1. **Mukherjee, D.**, Diamond, S.L., and Shadden, S.C. Towards Developing Hybrid Particle-continuum Frameworks For Thrombosis And Embolization Biomechanics In Large Arteries. *The 8'th World Congress Of Biomechanics, Dublin, Ireland.* July 2018.
2. **Mukherjee, D.**, and Shadden S.C. Hybrid Particle-continuum Computational Models For Thrombus Biomechanics. *The 13'th World Congress On Computational Mechanics, New York City, New York.* July 2018.
3. Pyne, J., **Mukherjee, D.**, Ryu, J., Narvid, J., and Shadden S.C. Computational Quantification Of Cerebrovascular Flow During A Trans-catheter Aortic Valve Implantation (TAVI) Procedure. *The Heart and Brain Symposium, Chicago, Illinois.* June 2018.

4. **Mukherjee, D.**, and Shadden. S.C. The Role Of Hemodynamics In Organizing Transport In Thrombus Neighborhood. *2018 Cellular and Molecular Bioengineering Conference, Biomedical Engineering Society, Key Largo, Florida.* January 2018.
5. **Mukherjee, D.**, Garduno, J., and Shadden, S.C. Flow-mediated Transport Around A Macroscopic Arterial Thrombus. *70'th Annual Meeting Of The American Physical Society Division Of Fluid Dynamics, Denver, Colorado.* November 2017.
6. Pyne, J., **Mukherjee, D.**, Narvid, J., Bowen, M., Dehkhargani, S., and Shadden, S.C. Approximating Ischemic Stroke Location And Abnormal Tissue Regions Through Subtracting NCCT And CTA Scans. *The 14th Annual UCSF Imaging Research Symposium, San Francisco, California.* October 2017.
7. **Mukherjee, D.**, and Shadden, S.C. Discrete Particle Techniques For Modeling Fragmentation Of Blood Clots. *14th United States National Congress On Computational Mechanics, Montreal, Canada.* July 2017.
8. **Mukherjee, D.**, and Shadden, S.C. Particle-based Computational Techniques For Stroke And Thrombosis. *Berkeley/Stanford Computational Mechanics Festival (CompFest), Berkeley, California.* April 2017.
9. **Mukherjee, D.**, and Shadden, S.C. Fictitious Domain Based Models For Resolving Interaction Of A Clot With Blood Flow. *69th Annual Meeting Of The American Physical Society Division Of Fluid Dynamics, Portland, Oregon.* November 2016.
10. Jani, N.D., **Mukherjee, D.**, and Shadden, S.C. Evaluating Blood Flow And Embolus Distribution In The Brain As A Function Of The Anatomy Of The Circle Of Willis. *69th Annual Meeting Of The American Physical Society Division Of Fluid Dynamics, Portland, Oregon.* November 2016.
11. Jani, N.D., **Mukherjee, D.**, and Shadden S.C. Influence Of Variations In Circle Of Willis Anatomy On Cerebral Circulation & Embolus Distribution. *Annual Meeting Of The Biomedical Engineering Society, Minneapolis, Minnesota.* October 2016.
12. **Mukherjee, D.**, and Shadden, S.C. Thrombus Hemodynamics Interactions: From Intra-Thrombus Transport To Macro-Scale Flow Structures. *Mechbio Symposium: Putting Together The Cell Mechanome, San Diego, California.* August 2016.
13. **Mukherjee, D.**, and Shadden, S.C. Modeling Embolus Transport & Thrombus Interaction With Arterial Hemodynamics & Its Relevance To Improving Treatment Procedures. *The 5th International Conference on Engineering Frontiers In Pediatric & Congenital Heart Disease, Orlando, Florida.* June 2016. - [**best poster award**]
14. **Mukherjee, D.**, Jani, N.D., and Shadden, S.C. Characterizing Embolus Transport To The Circle Of Willis. *The 8th International Bio-Fluids Symposium, Pasadena, California.* February 2016.
15. **Mukherjee, D.**, Jani, N.D., and Shadden, S.C. Modeling And Simulation Of Cardiogenic Embolic Particle Transport To The Brain. *68th Annual Meeting Of The American Physical Society Division Of Fluid Dynamics, Boston, Massachusetts.* November 2015.
16. Casas, G., **Mukherjee, D.**, Celigueta, M.A., Zohdi, T.I., and Onate, E. Large-Scale Grain Distribution Simulations With Rotating Machinery Using Efficient Discrete Element Models. *Particles 2015 - IV International Conference On Particle-Based Methods: Fundamentals And Applications, Barcelona, Spain.* September 2015.
17. **Mukherjee, D.**, and Shadden, S.C. Embolus Interactions With Blood Flow And Its Role In Stroke. *13th United States National Congress On Computational Mechanics, San Diego, California.* July 2015.
18. **Mukherjee, D.**, and Shadden, S.C. A Patient-Specific CFD-Based Study Of Embolic Particle Transport For Stroke. *67th Annual Meeting Of The American Physical Society Division Of Fluid Dynamics, San Francisco, California.* November 2014.
19. **Mukherjee, D.**, Zaky, Z., Zohdi, T.I., Salama, A., and Sun, S. Investigation Of Noninvasive Healing Of Damaged Piping System Using Electro-Magneto-Mechanical Methods. *Society Of Petroleum Engineers International Oilfield Corrosion Conference And Exhibition, Aberdeen, United Kingdom.* May 2014. - [**best poster award**]

20. **Mukherjee, D.**, and Zohdi, T.I. Collision Driven Particle Dynamics Simulations For Analyzing Flows Of Particulate Sprays And Jets. *66th Annual Meeting Of The American Physical Society Division Of Fluid Dynamics, Pittsburgh, Pennsylvania.* November 2013.
21. **Mukherjee, D.**, and Zohdi, T.I. Electromagnetic Control Of Charged Particulate Spray Systems - Planning The Spray-Gun Operations. *SIAM Conference On Geometrical And Physical Modeling, Denver, Colorado.* November 2013.
22. **Mukherjee, D.**, and Zohdi, T.I. Discrete Particle Simulation For The Analysis Of Colliding And Flowing Particulate Media. *Berkeley/Stanford Computational Mechanics Festival (CompFest), Berkeley, California.* October 2013.
23. **Mukherjee, D.**, and Zohdi, T.I. Development Of A Computer Simulation Tool For Discrete Element Method And Collision Driven Particle Dynamics Simulations. *12th United States National Congress On Computational Mechanics, Raleigh, North Carolina.* July 2013.

Invited Talks

1. *Computational Investigations On Unravelling The Hemodynamic Underpinnings Of Cardiovascular Diseases* - invited talk at the Department of Mechanical Engineering, the University of Colorado Boulder, March 2018.
2. *Particles In Flow: Computational Insights Into The Rich Dynamics Of Particle Systems With Applications In Manufacturing And Biomechanics* - invited talk at the Department of Mechanical and Aerospace Engineering, the University at Buffalo, February 2018.
3. *Insights Into Developing Patient-specific Computational Fluid Dynamics Models For Cardiovascular Diseases* - invited talk at the Department of Mechanical Engineering, Villanova University, February 2018.
4. *Computational Investigations On The Hemodynamic Underpinnings Of Cardiovascular Diseases* - invited talk at the Department of Mechanical Engineering, University of Nevada, Reno, January 2018.
5. *Understanding Blood Flow And Flow Mediated Transport Around Arterial Blood Clots* - invited talk at the Berkeley Fluids Seminar Series, U.C. Berkeley, October 2017.
6. *Discrete Particle Based Computational Techniques For Investigating The Role Of Hemodynamics In Stroke And Thrombosis* - invited talk at Department of Mathematics, University of Houston, September 2017.
7. *Exploring The Hemodynamic Underpinnings Of Stroke, Thrombosis, And Embolisms* - invited talk at Auburn University Seminar Series, September 2017.
8. *Hybrid Particle-continuum Modeling For Thrombosis And Embolism - An Overview* - invited talk at the Diamond Lab, Institute for Medicine and Engineering, University of Pennsylvania, August 2017.
9. *Collective Dynamics And Flow Of Particle Systems: Applications In Industry And Healthcare* - invited talk at the Department of Mechanical Engineering, Stony Brook University, April 2017.
10. *Image-driven, Particle Based Computational Models For Thrombotic And Embolic Phenomena In Large Arteries* - invited talk at the Berkeley Fluids Seminar series, U.C. Berkeley, October 2016.
11. *Image-based Computational Modeling Of Thrombotic And Embolic Phenomena In Large Arteries* - invited talk at Medtronic Neurovascular, Irvine, California, June 2016.
12. *Discrete Particle Simulations For The Analysis Of Colliding And Flowing Particulate Media* - invited talk at the Berkeley Fluids Seminar series, U.C. Berkeley, October, 2013.
13. *Discrete Element And Collision Driven Particle Dynamics Simulations For Manufacturing* - invited talk at Siemens Energy, Orlando, Florida, April, 2013.
14. *The Story Of Sprays, Grains, And Computers - An Overview Of Probing Granular & Particulate Material Using Computer Simulations* - invited talk at the Department of Physics, Indian Institute of Science Education & Research, Bhopal, India, January 2013.

Research Experience

- **Multi-scale biomechanics of thrombosis**
  - Developing meso-scale computational models for thrombus deformation and embolization under flow.
  - Developed tools to investigate flow-mediated transport phenomena in the thrombus neighborhood.
- **Image-based computational modeling for stroke**
  - Devised a modeling framework for embolus transport in large arteries for elucidating mechanics and etiology of stroke and embolisms.
  - Coupled multi-scale fluid dynamics models with medical imaging to study cerebrovascular flow for stroke and ischemia.
- **Multi-physics modeling of particulate media**
  - Modeling and analysis of electromagnetically guided particulate flows for industrial applications.
  - Devised numerical methods for modeling particle deposition for modern manufacturing applications.
- **Numerical methods for collision driven particle dynamics**
  - Devised neighbor-list collision driven particle dynamics techniques for flowing particulate media.
  - Created simulation tools for applications in manufacturing processes involving functionally engineered surface coatings.
- **Other experiences**
  - Finite element modeling of effective properties of heterogeneous particulate composite materials.
  - Design and computational analysis for a novel wave-energy device based on decommissioned ships.
  - Investigated system reliability methods for wave energy device operations.
  - Performed fluid-structure interaction modeling for twin-hull ocean vessels.

Teaching & Academic Experience

1. Teaching Assistant: Graduate courses at Department of Mechanical Engineering, U.C. Berkeley
   - ME280A: Graduate Introduction to Finite Element Analysis. (*Fall 2011*) **[outstanding GSI award]**
   - ME202: Computational Design of Multifunctional Materials. (*Spring 2012*)
2. Teaching Assistant: Undergraduate courses at Department Of Mechanical Engineering, U.C. Berkeley
   - ME107A: Experimentation & Measurements. (*Fall 2008, Spring 2009, Fall 2009*)
   - ME102A: Measurement Systems for Mechatronics. (*Spring 2010*)
   - ME135: Microprocessor Based Mechanical Systems. (*Spring 2010*)
3. Selected for an Intensive College Level Teaching Course organized by the Postdoc Teaching Opportunities Program (P.T.O.P), U.C. Berkeley, October 2015 (*20 out of 73 applicants were selected*).
4. Organizer of a bootcamp session on basics of Matlab programming for students at the Transfer To Excellence (TTE) Research Experience for Undergraduates (REU) program funded by National Science Foundation. (*Summer 2014*)
5. Guest lecturer on software tools for hemodynamics modeling for graduate course titled *'Fluid Mechanics of Biological Systems'*, Dept. of Mechanical Engineering, U.C. Berkeley. (*Spring 2014*)
6. Co-organizer and instructor for the *'Freshman Energy Engineering Seminar Series'* for the College of Engineering, U.C. Berkeley. (*Fall 2013*)
7. Math Instructor for the Pre-Collegiate Academy, Incentive Awards Program, U.C. Berkeley. Developed and taught a complete six-week course on calculus from scratch, including assignments and examinations. (*Summer 2010*)

Mentorship Experience

1. Supervisor and mentor for five undergraduate researchers working on computational fluid dynamics of the cerebral vasculature: (*January, 2015 - present*)
   - Anusree Oruganti
   - Abhinav Koppu
   - Aditya Aiyer
   - Neel D. Jani (*currently a staff research associate at UCSF and San Francisco VA Medical Center*)
   - Kartiga Selvaganesan (*currently an NIH Postbaccalaureate Fellow*)
   - Christopher Lee Weng (*currently a graduate student at Johns Hopkins*)
2. Mentor for three undergraduate exchange students for the National Science Foundation (NSF) funded Transfer To Excellence (TTE) Research Experience for Undergraduates (REU) Program, at U.C. Berkeley: (*Summer 2014, 2015, 2017*)
   - Jose Padilla
   - Tiffany Pan
   - Jocelyn Garduno
3. Mentor for the New York Academy of Sciences STEM Scholar Mentorship Program aimed at high-school STEM students from around the world. *(2017-present)*
4. Mentor for two K-12 teachers as a part of the Berkeley Engineering Research Experience for Teachers (RET) program funded by National Science Foundation: (*Summer 2016*)
   - Suzanne LeBaron - science teacher from the Oakland High School district.
   - Russel Bierle - pre-service teacher from the CalTeach program at U.C. Berkeley.
5. Mentor and supervisor for a capstone project for the professional Masters of Engineering program at U.C. Berkeley on gas turbine blade thermo-mechanical design, in collaboration with Siemens Corporation. (*Fall 2012 & Spring 2013*)
6. Organizer of a *'Discipline Cluster Workshop'* for the teaching conference for training and mentoring first-time GSI's (teaching assistants), with the U.C. Berkeley GSI Teaching & Resource Center. (*Fall 2012*)

Professional Service

1. Organizer of minisymposium on *'Computational Multiphysics Modeling Of Cardiovascular Systems'* for the upcoming World Congress on Computational Mechanics, 2018 alongwith A. Krishnamurthy and M.C. Hsu from Iowa State University.
2. Co-organizer of the AmeriMech mechanobiology symposium titled *Putting Together The Cell Mechanome: Finding The Pieces, Building The Puzzle* organized on August 4-5, 2016, at U.C. San Diego; sponsored by the National Academies of Sciences, Engineering, and Medicine, and National Science Foundation.
3. Volunteer for outreach event for middle school students named *'Biomechanical Engineering in Healthcare'*, organized through the Johns Hopkins Center For Talented Youth (JHU-CTY), September 2015.
4. Co-organizer of the Berkeley/Stanford Computational Mechanics Festival (CompFest) workshop held at U.C. Berkeley on October 19th, 2013, alongwith Prof. Tarek Zohdi.
5. Reviewer:

   Computational Mechanics; Journal of Computational Particle Mechanics; Journal of Computational Physics; Journal of Biomechanical Engineering; British Journal of Radiology; International Journal for Numerical Methods in Engineering; PLoS One; Journal of Biomechanics; Current Opinion in Biomedical Engineering; Cardiovascular Engineering and Technology; Applied Mathematical Modeling; Biomechanics and Modeling in Mechanobiology; Annals of Biomedical Engineering; International Journal for Numerical Methods in Biomedical Engineering.
6. Member:

   American Heart Association (AHA); Biomedical Engineering Society (BMES); American Physical Society (APS); Society for Industrial and Applied Mathematics (SIAM).

7. Served on departmental student committee to help interview during multiple departmental faculty searches, and on multiple student panels addressing departmental student affairs.

Collaborations

- Scott Diamond, University of Pennsylvania - Multi-scale modeling of thrombosis guided by experimental data on human blood clotting.
- Jared Narvid, University of California, San Francisco - Clinical collaboration on characterization of cerebrovascular flow and embolic stroke risks using patient radiological datasets.
- Eugenio Onate, Guillermo Casas, International Center for Numerical Methods in Engineering (CIMNE), Technical University of Catalonia, Barcelona - Efficient numerical methods for large-scale, industrial handling of granular materials.
- Shuyu Sun, Amgad Salama, King Abdullah University of Science & Technology (KAUST), Saudi Arabia - Designing magnetically guided particle streams for non-invasive oil pipeline healing technology.

Software

Developed a general purpose Discrete Element simulation library from scratch, and continue to actively develop and maintain the code. The library is capable of simulating a broad range of multi-physics phenomena involving discrete particle systems, and involving particle based numerical methods, with support to external libraries like VTK (for visualization), and OpenMP (for parallelization)

References

Available upon request.