

Biographical Sketch  
Dr. Patrick Diehl (Research Staff)

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Center for Computation & Technology Louisiana State University Digital Media Center, Room  
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**(a) Professional Preparation**

University of Stuttgart, Computer Science, MS. 2012

University of Bonn, Applied Mathematics, PhD. 2017

**(b) Appointments**

Current Research Staff, Center of Computation & Technology, Louisiana State University,  
Baton Rouge, LA

02/17–09/18: Postdoctoral Associate, Ecole de Polytechnique Montreal, Montreal, Quebec, Canada

04/13–01/17: Research Assistant/Phd candidate, Institute for Numerical Simulation, University of  
Bonn, Bonn, Germany

07/12–03/13: Research Assistant/Phd candidate, Institute for Simulation of large Systems, Uni-  
versity of Stuttgart, Stuttgart, Germany

**(c) Products**

**(c).1 Products Most Closely Related to the Proposed Project**

1. Diehl P, Prudhomme S, Levesque M. A review of benchmark experiments for the validation of peridynamics models. *Journal of Peridynamics and Nonlocal Modeling*. 2019 Apr 15;1(1):14-35. review of benchmark experiments for the validation of peridynamics models
2. Delorme, R., Diehl, P., Tabiai, I. et al. Extracting Constitutive Mechanical Parameters in Linear Elasticity Using the Virtual Fields Method Within the Ordinary State-Based Peridynamic Framework. *J Peridyn Nonlocal Model* (2020). <https://doi.org/10.1007/s42102-019-00025-7>
3. Diehl, P., Franzelin, F., Pflüger, D. et al. Bond-based peridynamics: a quantitative study of Mode I crack opening. *Int J Fract* 201, 157–170 (2016). <https://doi.org/10.1007/s10704-016-0119-5>
4. Tabiai I, Tkachev G, Diehl P, Frey S, Ertl T, Therriault D, Levesque M. Hybrid image processing approach for autonomous crack area detection and tracking using local digital image correlation results applied to single-fiber interfacial debonding. *Engineering Fracture Mechanics*. 2019 Jul 1;216:106485. <https://doi.org/10.1016/j.engfracmech.2019.106485>
5. Diehl P, Schweitzer MA. Simulation of wave propagation and impact damage in brittle materials using peridynamics. In *Recent trends in computational engineering-CE2014 2015* (pp. 251-265). Springer, Cham.

**(c).2 Other Significant Products,**

1. Shirzad S, Diehl P, Kaiser H, Prudhomme S, Lemoine AS. Scheduling Optimization of Parallel Linear Algebra Algorithms Using Supervised Learning. In *2019 IEEE/ACM Workshop on Machine Learning in High Performance Computing Environments (MLHPC)* 2019 Nov 18 (pp. 31-43). IEEE. <https://doi.org/10.1109/MLHPC49564.2019.00009>

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2. Bussler M, Diehl P, Pflüger D, Frey S, Sadlo F, Ertl T, Schweitzer MA. Visualization of fracture progression in peridynamics. *Computers & Graphics*. 2017 Oct 1;67:45-57. <https://doi.org/10.1016/j.cag.2017.05.003>
  3. Diehl P, Tabiai I, Baumann FW, Therriault D, Levesque M. Long term availability of raw experimental data in experimental fracture mechanics. *Engineering Fracture Mechanics*. 2018 Jun 15;197:21-6. <https://doi.org/10.1016/j.engfracmech.2018.04.030>
  4. Diehl P, Bussler M, Pflüger D, Frey S, Ertl T, Sadlo F, Schweitzer MA. Extraction of fragments and waves after impact damage in particle-based simulations. In *Meshfree Methods for Partial Differential Equations VIII 2017* (pp. 17-34). Springer, Cham.
  5. Franzelin F, Diehl P, Pflüger D. Non-intrusive uncertainty quantification with sparse grids for multivariate peridynamic simulations. In *Meshfree Methods for Partial Differential Equations VII 2015* (pp. 115-143). Springer, Cham.

#### **(d) Synergistic Activities**

1. Conference service: (i) Mini-symposium organizer: “Modeling and Simulation for Complex Material Behavior”, 14th U.S. National Congress on Computational Mechanics; (ii) Mini-symposium organizer: “Peridynamic theory and multiscale methods for complex material behavior”, 14th World Congress in Computational Mechanics and ECCOMAS Congress; (II) Workshop organizer: “USACM thematic Workshop on Experimental and Computational Fracture Mechanics”, February 26-28, 2020. (III) Meeting organizer: 3rd Annual Meeting of the SIAM Texas-Louisiana Section, October 16 -18, 2020 (IV) Panels moderator: TBAA: Task-Based Algorithms and Applications, Moderator, ”International Conference for High Performance Computing, Networking, Storage and Analysis (SC)” 2020
2. Community service: (i) Co-host of the FLOSS for Science podcast where we showcase how Free/Libre Open Source Software is used to enhance the openness of science (ii) Co-founder of the the Open Data in Experimental Mechanics project where we investigate how sharing experimental data can enhance the openness of science (III) Liaison for the Louisiana district of the SIAM Texas-Louisiana Section
3. Mentoring: (i) Main-organizer and mentor of Google Summer of Code and Google Season of Docs at Stellar group at LSU
4. Teaching: (i) Developed a new course Parallel Computational Math for undergraduate students to teach them Modern C++ and distributed parallel computing using mathematical models as examples. (ii) Published all course materials (lecture slides, exercise, and code samples) as Creative-Commons-licensed and provide all LaTeX source files on Github.
5. Editorial tasks: (i) Topic editor for the Journal of Open Source Software (JOSS)

#### **(e) Collaborators & Other Affiliations**

Collaborators and Co-Editors: Louisiana State University: Juhan Frank; Domimnic Marcello; Robert Lipton; Juhan Frank; Hartmut Kaiser; Steve Brandt; Bibek Wagle; Rod Thoid; Ecole de Polytechnique Montreal: Serge Prudhome; École de technologie supérieure Montreal: Ilyass Tabiai; University of Stuttgart (Germany): Thomas Ertl; Gleb Tkachev; Dirk Pflüger; Gregor Daiß; University of Texas Austin: Prashant Kumar; University of Bonn (Germany): Marc Alexander Schweitzer University of Groningen (Netherlands): Steffen Frey;