

# Jayaram Hariharan

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## RESEARCH INTERESTS

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My research leverages numerical models and remote sensing data to answer questions at the intersection of civil engineering and geology. In particular I am interested in understanding how fluvial-deltaic environments will evolve under changing external conditions.

## EDUCATION

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- **The University of Texas at Austin** Austin, TX  
*PhD, Civil Engineering* May 2019 – Aug. 2022 (Expected)
  - **Thesis:** Top to Bottom: Modeling and Analyzing River Delta Surface Morphology and Subsurface Form
- **University of Maryland, College Park** College Park, MD  
*MS, Civil Engineering* Aug. 2017 – May 2019
  - **Thesis:** Quantifying the Influence of Surface Processes on Subsurface Geometry in Deltaic Environments
- **University of Maryland, College Park** College Park, MD  
*BS, Civil and Environmental Engineering* Aug. 2011 – Dec. 2014

## PROFESSIONAL EXPERIENCE

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- **Los Alamos National Laboratory** Los Alamos, NM  
*Student Intern* Jan. 2021 - Jun. 2021
  - Applying graph theory to better quantify flux partitioning in river deltas
- **Gutschick, Little & Weber P.A.** Burtonsville, MD  
*Civil Engineer* Jan. 2015 - Jul. 2017
  - Led civil engineering site design for 2 commercial land development projects
  - Provided expert testimony at Planning Board meetings and public hearings

## PUBLICATIONS

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- [9] Steel, E., C. Paola, A. Chadwick, **J. Hariharan**, P. Passalacqua, Z. Xu, H.A. Michael, H. Brommecker, E. Hajek (submitted), Reconstructing subsurface sandbody connectivity from temporal evolution of surface networks, Basin Research.
- [8] Moodie, A. J., **J. Hariharan**, E. Barefoot, & P. Passalacqua (under review), *pyDeltaRCM*: a flexible numerical delta model, Journal of Open Source Software.
- [7] Tull, N., P. Passalacqua, H. Hassenruck-Gudipati, S. Rahman, K. Wright, **J. Hariharan**, & D. Mohrig (under review), Bidirectional River-Floodplain Connectivity During Combined Pluvial-Fluvial Events, Water Resources Research.
- [6] **Hariharan, J.**, A. Moodie, & P. Passalacqua (under review), Spectral Band Synthesis: Using Previously Trained Models on New Data, Earth and Space Science.
- [5] Xu, Z., **J. Hariharan**, P. Passalacqua, E. Steel, C. Paola, & H.A. Michael (accepted), Linking the Surface and Subsurface in River Deltas - Part 2: Relating Subsurface Geometry to Groundwater Flow Behavior, Water Resources Research.
- [4] **Hariharan, J.**, Z. Xu, H.A. Michael, C. Paola, E. Steel, & P. Passalacqua (accepted), Linking the Surface and Subsurface in River Deltas - Part 1: Relating Surface and Subsurface Geometries, Water Resources Research.

- [3] Miltenberger, A.M, T. Mukerji, **J. Hariharan**, P. Passalacqua, & E. Nesvold (under review), A Graph-Theoretic Monte Carlo Framework for Comparing Delta Morphology, Morphodynamics, and Stratigraphy in Numerical Models and Physical Experiments, *Mathematical Geosciences*.
- [2] Schwenk, J. & **J. Hariharan** (2021), RivGraph: Automatic Extraction and Analysis of River and Delta Channel Network Topology, *Journal of Open Source Software*, 6(59), 2952, <https://doi.org/10.21105/joss.02952>.
- [1] **Hariharan, J.**, K. Wright, & P. Passalacqua (2020), dorado: A Python package for simulating passive particle transport in shallow-water flows, *Journal of Open Source Software*, 5(54), 2585, <https://doi.org/10.21105/joss.02585>.

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## TEACHING EXPERIENCE

- **The University of Texas at Austin** Austin, TX  
*Graduate Teaching Assistant*
  - Substitute lecturer for the hydrology and stochastic hydrology courses Fall 2019
  - Teaching assistant for undergraduate hydraulic engineering course Spring 2020
  - Grader for undergraduate hydraulics and hydrology courses Fall 2018, 2019, and 2020

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## ACADEMIC AND VOLUNTEER ACTIVITIES

- **Academic Activities**
  - **UT Austin:** Graduate and Industry Networking (GAIN) committee member 2018
  - **UT Austin:** Environmental and Water Resources Engineering Seminar committee member 2018
  - **CSDMS:** Interactive Teaching Material Creation Dec. 2020  
    - \* **Creator of EKT Lab:** *Alternative mesh generation for Landlab* [link]
  - **Peer-reviewer:** Computers & Geosciences; Journal of Open Source Software 2020-
  - **Topic Editor:** Journal of Open Source Software 2021-
- **Volunteer Activities**
  - **St. David's Hospital, Austin, TX:** Weekly Volunteer (3 hrs/wk) Apr. 2019 - Apr. 2020

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## GRANTS AND AWARDS

- **Grants**
  - **NSF Supplement:** INTERN Funding Opportunity (\$44,999) FY 2020
- **Awards**
  - University Graduate Continuing Fellowship 2021-2022
  - Trigg and Fannie E. Twichell Centennial Endowed Presidential Scholarship 2020
  - Earnest and Agnes Gloyna Endowed Presidential Scholarship 2019
  - Walter L. and Reta Mae Moore Graduate Fellowship in Water Resources 2017
  - University of Maryland President's Scholarship 2011-2014

## SHORT COURSES

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- **Participant**

- **Geoscientific data analysis using UNIX and GMT** [UTIG] 2021
- **Earth Surface Processes Modeling Summer Institute** [CSDMS] 2020
- **Summer Institute for Earth-Surface Dynamics** [NCED] 2018

- **Peer-Mentor**

- **Earth Surface Processes Modeling Summer Institute** [CSDMS] 2021

## SKILLS AND LICENSES

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- **Skills**

- **Programming/Scripting:** Python, L<sup>A</sup>T<sub>E</sub>X, MATLAB, Julia, Kotlin, Git, Unix, Bash, Unit Testing
- **Engineering/Mapping:** AutoCAD Civil 3D, HEC-RAS, ArcGIS/QGIS, Generic Mapping Tools
- **Other:** MS Office, GIMP, Illustrator/Inkscape, IHS Kingdom, Audacity

- **Licenses**

- **State of Maryland Engineer in Training (EIT)** Licence #46507

## NON-REFEREED PUBLICATIONS

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- [2] **Hariharan, J.** (2020), `py_gee_tools` v0.1, Zenodo, <http://doi.org/10.5281/zenodo.4331356>
- [1] **Hariharan, J.** (2019), Quantifying the Influence of Surface Processes on Subsurface Geometry in Deltaic Environments, M.S. Thesis, University of Texas, Austin

## CONFERENCE ABSTRACTS AND PRESENTATIONS

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- [10] **Hariharan, J.**, K. Wright, P. Passalacqua (2021), Modeling The Influence Of Polders On River Delta Connectivity, 8th International Conference on Water and Flood Management, Abstract 100261.
- [9] Tull, N., S. Rahman, P. Passalacqua, K. Wright, **J. Hariharan**, H. Hassenruck-Gudipati, D. Mohrig (2020), Determining Local Mesh Resolution for Accurate Modeling of River-Floodplain Connectivity, 2020 AGU Fall Meeting, Abstract H137-003
- [8] Moodie, A. J., **J. Hariharan**, J. Caers, P. Passalacqua (2020), Constraining autogenic smaller-scale stratigraphic variability via information theoretic relationships with larger-scale observations, 2020 AGU Fall Meeting, Abstract EP025-06
- [7] Xu, Z., **J. Hariharan**, P. Passalacqua, C. Paola, E. Steel, H. A. Michael (2019), Contaminant transport in deltaic aquifers: The impact of surface-to-subsurface connectivity, 2019 AGU Fall Meeting, Abstract EP21D-2237
- [6] Steel, E., C. Paola, P. Passalacqua, H. A. Michael, **J. Hariharan**, Z. Xu (2019), Linking surface dynamics to the subsurface record: the effectiveness of overhead imagery in quantifying depositional architecture, 2019 AGU Fall Meeting, Abstract EP21D-2236
- [5] **Hariharan, J.**, P. Passalacqua (2019), Modeling Deltaic Evolution Amidst Anthropomorphic Development, 2019 AGU Fall Meeting, Abstract EP23E-2261
- [4] Miltenberger, A., T. Mukerji, P. Passalacqua, **J. Hariharan** (2019), Comparing a Delta Numerical Model to a Flume Experiment using Monte Carlo Simulations and Graph Theory, 2019 AGU Fall Meeting, Abstract EP31A-06
- [3] Michael, H. A., Z. Xu, **J. Hariharan**, P. Passalacqua, C. Paola, E. Steel, M. C. Perignon (2018), Surface to Subsurface Connectivity in River Deltas: From Depositional Processes to Preferential Groundwater Flow, 2018 AGU Fall Meeting, Abstract EP42A-07.
- [2] Xu, Z., H. A. Michael, **J. Hariharan**, P. Passalacqua, C. Paola, M. C. Perignon, E. Steel (2018), Relations between static and dynamic connectivity in a deltaic aquifer, 2018 AGU Fall Meeting, Abstract EP43D-2744.
- [1] **Hariharan, J.**, M.C. Perignon, P. Passalacqua, Z. Xu, H. A. Michael, C. Paola, E. Steel (2018), Quantifying Connectivity Between the Surface and Subsurface in Numerically Modeled Deltas, 2018 AGU Fall Meeting, Abstract EP43D-2746.