

Jayaram Hariharan

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RESEARCH INTERESTS

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

- **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

- **Los Alamos National Laboratory** Los Alamos, NM
Student Intern *Jan. 2021 – Jun. 2021*
 - Applied graph theory methods to quantify flux partitioning error 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

- [8] Steel, E., C. Paola, A. Chadwick, **J. Hariharan**, P. Passalacqua, Z. Xu, H.A. Michael, H. Brommecker, E. Hajek (in revision), Reconstructing subsurface sandbody connectivity from temporal evolution of surface networks, Basin Research.
- [7] Tull, N., P. Passalacqua, H. Hassenruck-Gudipati, S. Rahman, K. Wright, **J. Hariharan**, & D. Mohrig (in revision), Bidirectional River-Floodplain Connectivity During Combined Pluvial-Fluvial Events, Water Resources Research.
- [6] Miltenberger, A.M, T. Mukerji, **J. Hariharan**, P. Passalacqua, & E. Nesvold (2021), A Graph-Theoretic Monte Carlo Framework for Comparing Delta Surface Dynamics and Subsurface Structure in Numerical Models and Physical Experiments, Mathematical Geosciences, 1-28, <https://doi.org/10.1007/s11004-021-09973-7>
- [5] Moodie, A. J., **J. Hariharan**, E. Barefoot, & P. Passalacqua (2021), *pyDeltaRCM*: a flexible numerical delta model, Journal of Open Source Software, 6(64), 3398, <https://doi.org/10.21105/joss.03398>.
- [4] Xu, Z., **J. Hariharan**, P. Passalacqua, E. Steel, C. Paola, & H.A. Michael (2021), Linking the Surface and Subsurface in River Deltas - Part 2: Relating Subsurface Geometry to Groundwater Flow Behavior, Water Resources Research, 57, e2020WR029281, <https://doi.org/10.1029/2020WR029281>.
- [3] **Hariharan, J.**, Z. Xu, H.A. Michael, C. Paola, E. Steel, & P. Passalacqua (2021), Linking the Surface and Subsurface in River Deltas - Part 1: Relating Surface and Subsurface Geometries, Water Resources Research, 57, e2020WR029282, <https://doi.org/10.1029/2020WR029282>.

- [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>.

TEACHING EXPERIENCE

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

ACADEMIC AND VOLUNTEER ACTIVITIES

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

GRANTS AND AWARDS

- **Grants**
 - **NSF Supplement:** INTERN Funding Opportunity (\$44,999) FY 2020
- **Awards**
 - Kolodzey Travel Grant Fall 2021
 - 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

- **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

- **Skills**

- **Programming/Scripting Languages:** Python, Bash, MATLAB, Julia, R, Kotlin
 - **Programming Tools** Git, Unix, Continuous Integration, Unit Testing
 - **Engineering/Mapping:** AutoCAD Civil 3D, HEC-RAS, ArcGIS/QGIS, Generic Mapping Tools
 - **Office/Media:** L^AT_EX, MS Office, GIMP, Illustrator/Inkscape, IHS Kingdom, Audacity

- **Licenses**

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

NON-REFEREED PUBLICATIONS

- [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

- [15] Wright, K. A., **J. Hariharan**, P. Passalacqua, G. Salter, M. P. Lamb, M. Simard (2021), Comparing the Nourishment Areas and Dynamics of Different Fluvially-Transported Materials in River Deltas, 2021 AGU Fall Meeting, Abstract EP52A-03.
- [14] **Hariharan, J.**, A. Piliouras, J. Schwenk, P. Passalacqua (2021), Width-Based Discharge Partitioning in Distributary Networks: How Wrong Are We?, 2021 AGU Fall Meeting, Abstract H11D-05.
- [13] Passalacqua, P., T. M. Jarriel, **J. Hariharan**, S. L. Goodbred, I. Overeem, L. Giosan, A. Piliouras, J. P. Schwenk (2021), A network approach to delta sustainability, 2021 AGU Fall Meeting, Abstract H12D-01A.
- [12] Michael, H., Z. Xu, **J. Hariharan**, P. Passalacqua, M. Khan, K. Ahmed, A. Zahid, C. Paola, E. Steel, A. Chadwick (2021), From Surface to Subsurface: Connecting Depositional Processes and Surface Features to Subsurface Architecture and Contaminant Transport in Deltaic Aquifers, GSA Connects 20201, Abstract AM-367749.
- [11] Passalacqua, P., **J. Hariharan**, H. Michael, C. Paola, Z. Xu, E. Steel, A. Chadwick, M. Khan (2021), From Surface to Subsurface: Connectivity, Metrics, and Predictability of Subsurface Patterns from Surface Information, GSA Connects 2021, Abstract AM-367301.
- [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.