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 – May 2022 (Expected)*
    - **Thesis**: Top to Bottom: Modeling and Analyzing River Delta Surface Morphology and Subsurface Form

  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

- **The University of Texas at Austin**   Austin, TX
  Graduate Research Assistant   *Aug. 2017 - Present*
    - Numerical modeling of river delta evolution and growth
    - Graph theoretical analysis of river delta morphology
    - Surface-Subsurface relationship in river deltas

- **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

[6] **Hariharan, J.**, A. Moodie, and P. Passalacqua (submitted). 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 (under review), 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 (under review), 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, and 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

  ○ 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

CONFERENCE ABSTRACTS AND PRESENTATIONS

[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.

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

- **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**
  - ○ 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

- **Short Courses**
  - ○ **Earth Surface Processes Modeling Summer Institute** [CSDMS]   2020
  - ○ **Summer Institute for Earth-Surface Dynamics** [NCED]   2018

Skills and Licenses

- **Skills**
  - ○ **Programming/Scripting:** Python, LaTeX, MATLAB, Julia, Kotlin, Git, Unix, Bash, Unit Testing
  - ○ **Engineering/Mapping:** AutoCAD Civil 3D, HEC-RAS, ArcGIS/QGIS, AutoTURN
  - ○ **Other:** MS Office, GIMP, Inkscape, IHS Kingdom, Audacity

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