

# SUBHAJIT GHOSHAL

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## CURRICULUM VITAE

### Career Interest

Develop and apply remote sensing/image processing algorithms, integrated with GIS tools in applied fields of Earth Science, for improved interpretation and understanding of Earth system processes.

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### Education

- **PhD in Geography**, Department of Geography, University of South Carolina, Columbia, South Carolina, USA (Ph.D degree completed August, 2011).  
*Dissertation:* Planimetric and Volumetric Analysis of Channel Change in the Post-Hydraulic Mining Period in the Central Valley, California.  
*Committee Members:* Dr. L. Allan James (Advisor/Chair), Dr. John R. Jensen, Dr. Michael E. Hodgson, Dr. Venkat Lakshmi.
  - **Master of Science Applied Geology**, Department of Earth Sciences, Indian Institute of Technology Roorkee, Uttaranchal, India, M.S. degree completed July, 2002.  
*Thesis:* Application of Fourier Filtering in Image Processing.  
*Committee Members:* Dr. R. P. Gupta (Advisor), Dr. A. K. Sharaf (Chair), Dr. R. J. Sashtri.
  - **Certification of lectureship in India** by Council of Scientific and Industrial Research (CSIR-NET), Government of India, in **Earth, Planetary, Atmospheric and Oceanic Sciences**, June, 2002.
  - **Bachelor of Science Major: Geology**, Department of Geology, Presidency College, Calcutta, India, B.S. degree completed July, 2000; Minors: Mathematics and Chemistry.
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### Computer/GIS software Proficiency:

- **Programming Languages** : C, C++, Matlab, Python, Adobe Flex
- **Database:** ARCSDE, MSOL Database Server 2008
- **GIS &Image Processing softwares** : ARCGIS 10, ARCGIS Server 10, ARCSDE 10, Definiens Developer (Ecognition) 7.0, ERDAS Imagine 10, ENVI 4.7 , MapInfo 6.0, Geo-HECRAS. IDRISI Taiga, GRASS 6.4.1
- **Other Softwares/Packages** : Adobe Photoshop CS3, SURFER 7, Visual Studio, SAS, SPSS.
- **Web Designing software:** Dream weaver, Microsoft Publisher
- **Operating Systems** : Win 7, Win XP, Fedora, Redhat Linux

## Work Experience in Academia

### University of South Carolina, Columbia

#### Post-Doctoral Fellow

(August 2011 – Present)

- **Yuba County Water Agency funded project:** Historic Geomorphic and Land Use / Land Cover Reconstructions of the Lower Yuba River: Based on a Remote Sensing Analysis
    - We are developing a set of historical digitized aerial images and associated geomorphic and riparian analyses and geomorphic interpretations based on them.
    - My job in the project is to perform a comprehensive remote sensing and GIS analysis of the lower Yuba River, including cartometric analysis, vegetation mapping and classification, volumetric analysis of the sediment generated by channel erosion, extracting morphometric parameters from high spatial resolution remote sensing data and preparing and presenting data reports.
    - I am supervising 3 undergraduate students in this project.
  - **ARCSDS Geodatabase Server:** Installed and implemented ArcSDS server 10 with MS SQL Server Express 2008 for workflow and data distribution for the above two projects
  - **ARCGIS webserver using Adobe Flex:** Installed and deployed ARCGIS webserver based on Adobe Flex.
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#### Research Assistant

(January 2006 – July 2011)

- I worked as research assistant, May 2006 to Dec. 2008, for the **NSF funded project “Tracking Hydraulic Mining Sediment in Sacramento Valley, California”** under PI Dr. Allan James. This is also my PhD dissertation project that involves:
  - Land cover change analysis through a period of 100 years in Central valley, CA
  - Topographical modeling using remote sensing data and historical maps.
  - Soft-copy photogrammetric analysis to extract elevation information from historic stereo aerial photographs and create DEMs.
  - LiDAR data cleaning, elevation calibrations, analysis and interpretation.
  - Planimetric and volumetric analysis of channel morphology and lateral migration from remotely sensed data.
  - Aerial photograph and historical map registration and analysis for river-channel change detections, morphometric analysis of channels and floodplains, and sediment budget computations.
  - Preparing and presenting data reports to the technical and non-technical audiences.

## Teaching Experience

University of South Carolina, Columbia

(January 2006 – Present)

### **Instructor:**

- Geography 345 (*Interpretation of Aerial Photographs*) three semesters (Fall 2008, Spring 2009, Spring 2010, Fall 2010).
- Geography 103 (*Introduction to Geography*): Summer 1, 2009 and Summer 1, 2010.

### **Teaching Assistant:**

- Geography 551 (*Principles of Remote Sensing*): Teaching and lab assistant to Dr. John R Jensen (Fall 2009).
- Geography 201 (*Landform Geography*): Teaching and lab assistant to Dr. Allan James (Fall 2007).
- Geology 103 (*Environment of Earth*): Teaching and lab assistant to Dr. Venkat Lakshmi (Spring 2006).

Presidency College Kolkata, India

(January 2004 – December 2005)

### **Lecturer (Geomorphology, RS and GIS):**

- I taught courses on “Principles Remote Sensing” and “Principles of GIS” and “Geomorphology” (Total students-74) in the Post Graduate Department of Geography

## Work Experience in Industry

City Government of Columbia, South Carolina

(August 2011-Present)

- **GIS Application Technician:** Primary responsibilities
  - Programming and developing the GIS webserver using Adobe Flex
  - Developing and managing ARCSDE on MSQl data structure
  - Object-based land use and Land cover classification for city of Columbia

Richland County Govt., Dept. of IT and GIS, South Carolina

(Summer 2008, 2009)

- **GIS Intern:** Primary responsibilities:
  - Decision based research for identifying and recommending the best commercial software available for object-based digital image classification( a qualitative and quantitative evaluation of Erdas Imagine Objective, VLS feature analyst, Definiens Developer and ENVI softwares);
  - Developed, implemented and deployed a LULC classification algorithm (a decision tree model) on object based digital image classification for the classification of high resolution 4-band digital aerial photographs for Richland County, S.C., using Definiens Developer (Ecognition) Software.
  - Development on existing geographic information system database (ARCSDE in MSQl environment) and SDSS

- **GIS analyst:** Primary responsibilities:
    - Digitize tube well locations and add ground water data as attributes.
    - Interpolate a surface from groundwater levels
    - Predict flow rates and directions for ground water in the region.
    - Detect arsenic-affected zones and quarantine those zones from drinking water resources.
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## Publications

- Singer, M., L. A. James, R. Aalto, N. Kilham, J. Higson, **S. Ghoshal**, (2011). Eroding toxic fan: Episodes in the legacy of 19th century gold mining in California. *Nature (in Review)*.
  - James, L. A., M. E. Hodgson, **S. Ghoshal**, M. Megison Latiolais, (2011). Geomorphic Change Detection Using Historic Maps and DEM Differencing: The Temporal Dimension of Geospatial Analysis. *Geomorphology (in press)*.
  - **Ghoshal S.**, L. A. James, M. Singer, R. Aalto (2010), "Channel and floodplain change analysis over a 100-year period: Sacramento Valley, California", *Remote Sens. 2010*, 2(7), 1797-1825; doi:10.3390/rs2071797. [Download pdf here](#)
  - James, L. A., **S. Ghoshal**, M. B. Singer, M. Megison, (2009), Sedimentation in the lower Yuba and Feather Rivers, California: Long-term effects of contrasting river-management strategies. In, James, L.A., Rathburn, S.L., and Whittecar, G.R., eds. *Management and Restoration of Fluvial Systems with Broad Historical Changes and Human Impacts: Geol. Soc. Amer. Spec. Paper* 451:57-81. doi: 10.1130/2008.2451 (01). [Download pdf here](#)
  - **Ghoshal. S.**, A. Sarkar. (2004). "Mapping the Landuse / Landcover of a Geographical Space through Digital Image Processing of Satellite Data", *Proceedings of XXIV INCA International Congress*. [Download pdf here](#)
  - **Ghoshal. S.**, A. Sarkar (2002). "Application of Fourier Filtering in Image Processing", *Indian Journal of Landscape system and ecological studies*, Vol. XV. December.
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## Conference Presentation:

- **Ghoshal, S.**, L. Allan James (2011) "Flood Plain and channel change analysis using DEM differencing: Lower Yuba River, California." *Paper presented at 2011 AAG Seattle Annual Meeting*
- **Ghoshal, S.**, L. Allan James(2010),"Planimetric and Volumetric Analysis of Channel Change in the Post- Hydraulic Mining Period: Central Valley, California", *Paper presented at 2010 AAG Washington DC on Annual Meeting*
- **Ghoshal, S.**, L. Allan James(2008),"Planimetric and Volumetric change analysis estimating lateral channel migration and associated timing and magnitude of sediment erosion in the post - hydraulic mining period in Lower Yuba River, California", *Paper presented at 2008 AAG Boston Annual Meeting*

- **Ghoshal, S., L. Allan James(2007)**, "Planimetric and Volumetric change analysis of historic mining sediment in Lower Yuba River California", *Poster at AGU 2006 at San Francisco*
  - **Ghoshal, S., L. Allan James, Michael B. Singer, Rolf E. Alto. (2006)** "Erosion of Hydraulic mining sediment and channel change: Sacramento Valley, California." Poster Presented at *Binghamton Geomorphological Conference in Columbia, South Carolina, 2006*
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### **Grants and awards**

- Doctoral level winner of the 2011 AAG Geomorphology Specialty Group Best Student Paper Competition \$ 250.
  - Graduate School Travel Grant Award Spring 2011, University of South Carolina, Columbia, SC: \$600
  - Graduate Research Fellow and Co PI for YCWA(2010-2011) funded project "Historic Geomorphic and Land Use / Land Cover Reconstructions of the Lower Yuba River: Based on a Remote Sensing Analysis" with PI Dr. Allan James: \$ 61,000
  - Paul E Lovingood award for "Excellence in Graduate Doctorate Research", 2010: \$500
  - Graduate School Travel Grant Award Spring 2010, University of South Carolina, Columbia, SC: \$700
  - Graduate School Travel Grant Award Fall 2007, University of South Carolina, Columbia, SC: \$1100
  - Graduate research assistant fellowship for NSF funded project(2006-2007) "*Tracking Hydraulic Sediment in Sacramento Valley, California*" under PI Dr. Allan James: \$ 18,000
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### **Reviewer of Manuscripts submitted to:**

- Journal of GIScience & Remote Sensing

**Web Site administrator:** [www.subhajitweb.com](http://www.subhajitweb.com), [www.ankursc.net](http://www.ankursc.net)

**Professional membership:** American Association of Geographers, American society of Photogrammetry and Remote Sensing, American Geophysical Union, SEDAAG

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### **References:**

- [Dr. Venkat Lakshmi](#), Professor, Department of Earth and Oceanic Sciences, University of South Carolina, Columbia Email: [vlakshmi@geol.sc.edu](mailto:vlakshmi@geol.sc.edu) | (803) 777-3552
  - [Dr. John. R. Jensen](#), Professor, Department of Geography, University of South Carolina, Columbia Email: [jrjensen@sc.edu](mailto:jrjensen@sc.edu) | (803) 777-5790
  - [Dr. L. Allan James](#), Professor, Department of Geography, University of South Carolina, Columbia, Email : [ajames@sc.edu](mailto:ajames@sc.edu) | (803) 777-6117
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