

# Curriculum Vitae

## Rajendra Bose, Ph.D.

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**Academic professional with extensive experience building and leading teams within research institutions over the past fifteen years.** These teams provided high quality, specialized computing and data services and infrastructure to faculty, lab staff and students conducting research across many disciplines. Current interests include engaging with varied groups or audiences for science and technology-related education, presentations and training.

### Academic and Professional Experience

#### **Director of Researcher Engagement, Icahn School of Medicine at Mount Sinai**

**Mar 2023-Jul 2024**

Scientific Computing and Data

The Scientific Computing and Data group partnered with scientists to accelerate scientific discovery with the overarching goal of accelerating translational research and improving clinical care. The researcher engagement role managed a team that ensured responsive support and communications, and served as a senior point of contact for researchers and staff, for selected research data services.

#### **Principal Engineer, Scientific Computing, Chan Zuckerberg Biohub**

**Feb 2021-Mar 2022**

Built and led the initial Scientific Computing team for this nonprofit biomedical research organization during its fifth anniversary year; the San Francisco Biohub partners are the University of California San Francisco and Berkeley, and Stanford University. Our team provided computation and research data storage infrastructure and guidance for computational microscopy, sequencing, data science and other scientific platforms and research groups at the Biohub's San Francisco and Stanford sites.

#### **Director, Research Computing, Columbia University**

**Jan 2014-Dec 2020**

Mortimer B. Zuckerman Mind Brain Behavior Institute

Responsible for developing and implementing research computing services and infrastructure for the Mortimer B. Zuckerman Mind Brain Behavior Institute. The Research Computing team worked with 50 faculty labs and other groups with a population of roughly 800 researchers and other staff in the Zuckerman Institute to enable and accelerate their science.

**Manager, Research Computing Services, Columbia University      Aug 2009-Dec 2013**

Information Technology

Responsible for developing and advancing research computing services within Columbia's central IT division. The manager role involved working closely with faculty, research and information technology staff across the university, as well as senior administrators in the Office of Research Initiatives and elsewhere. Activities included: implementing professionally-managed, shared high performance computing and secure research data systems; defining strategies for biomedical and social science research computing with Columbia scientists, economists, and population-related researchers; and participating in university green data center initiatives.

**Digital Initiatives Manager, Columbia University      Jan 2008-Jul 2009**

Center for Digital Research and Scholarship (CDRS)

This position involved initiating and cultivating partnerships with Columbia research groups in all disciplines, and serving as a bridge for these groups to other divisions in the Columbia University Libraries/Information Services and various campus information technology teams.

**Postdoctoral Research Fellow, University of Edinburgh      2004-2007**

United Kingdom Digital Curation Centre and Database Group, School of Informatics

Self-directed research topics included database annotation, digital geospatial data curation, and approaches to citation for geospatial data products.

**Visiting Scientist, Columbia University      Jul-Oct 2007**

Center for International Earth Science Information Network (CIESIN)

Research project: **Applying semantics to socioeconomic Earth science product collections for enhanced data retrieval.** Included investigations of ontology design and prototype system development using Ruby and RDF/XML tools in collaboration with the International Research Institute for Climate and Society (IRI) data library managers and the CIESIN/Socioeconomic Data and Applications Center (SEDAC) metadata team.

**Graduate Student Researcher, University of California      1998-2004**

Institute for Computational Earth System Science and Bren School of Environmental Science and Management, University of California, Santa Barbara

Ph.D. dissertation topic: **Composing and conveying lineage metadata for environmental science research computing.** Ph.D. Advisor: Professor James Frew.

**Information Systems Consultant, Stanford University      1992-1998**

Independent consultant: Managed two complete lifecycle projects for design and implementation of integrated office information systems, including financial program development and legal document production. Tasks included project scheduling and prioritizing, arranging client meetings, writing proposals and design documents. Also served as an information systems consultant for other firms in the San Francisco Bay Area.

**Environmental Consulting: Senior Staff Engineer      1994-1996**

Woodward-Clyde Consultants, New York City Metropolitan Office

Responsible for managing geographical information for a major wetland restoration project, as well as providing support for other diverse projects, for this environmental consulting firm.

## Affiliations

- Coalition for Academic Scientific Computation (2010-2024)
- Association for Computing Machinery (1998-present)
- EDUCAUSE Advanced Core Technologies Initiative (ACTI) Campus Cyberinfrastructure Working Group (2010-2013)
- American Geophysical Union (1998-2012)

## Professional and Academic Activities

### Recent Activities

- Co-lead of regional New York City scientific computing and data group of over 10 institutions, 2018-2020 and 2023-2024
- National Science Foundation Panel and Committee participation, Alexandria and Arlington VA, various times from 2009-2020
- Member, Columbia Data Science Education Working Group, 2019-2020
- Executive Committee participation as past elected Chair, national Coalition for Academic Scientific Computation (CASC), 2019, 2020
- Executive Committee participation as elected Chair for 2017, 2018, and elected Vice-Chair for 2015, 2016, national Coalition for Academic Scientific Computation (CASC)

### Other Professional Activities

- Organizing Committee member for and participant in CASC/UK High Performance Computing Special Interest Group (HPC-SIG) workshop, Oxford, England, July 2015: **Towards Sustainable National Research Computing Centers and a Computational Workforce**
- Chair, Intercampus Subcommittee of faculty-led research computing committee, Columbia University, 2014-15 academic year
- Executive Committee participation as elected Secretary for national Coalition for Academic Scientific Computation (CASC) 2013, 2014
- Organizing Committee member for and participant in NSF-supported CASC workshop, Arlington VA, October 2013: **Sustainable Funding and Business Models for Academic Cyberinfrastructure Facilities II**
- Organizing Committee member for NSF-supported CASC workshop, Arlington VA, March 2013: **Research Data Management Implementations**
- Coordinator for research university CIO/CTO Common Solutions Group workshop, Princeton University, September 2012: **Big Data Trends on Campus**
- Organizing Committee member for NSF-supported CASC/EDUCAUSE ACTI workshop, Princeton University, July 2011: **Research Data Lifecycle Management**
- Affiliate Member, Columbia Population Research Center, Columbia University (2008-2020)
- Coordinator for research universities CIO/CTO Common Solutions Group workshop, Georgetown University, May 2010: **Research Computing Funding**
- Co-convener for Union session, American Geophysical Union (AGU) Fall 2008 Meeting: **The Library - Data Center Alliance in Earth and Space Sciences**
- Participant in Columbia University internal e-Science Task Force (2008-2009)

## Doctoral and Postdoctoral Activities

- Co-convenor for Earth and Space Science Informatics session, American Geophysical Union (AGU) Fall 2007 Meeting: **Embracing GIS in the Earth and Planetary Sciences**
- Program Committee (2005), Reviewer and Session Chair (2006), International Conference on Scientific and Statistical Database Management (SSDBM)
- Program Committee, 14th ACM International Symposium on Advances in Geographic Information Systems (ACM-GIS 2006)
- Program Committee, VLDB 2005 Workshop on Trends in Enterprise Application Architecture
- Advisor to M.Sc. in GIS student Jeff (Xiaodi) Chen (Institute of Geography, University of Edinburgh) on his thesis project: **Implementing an online geospatial repository to manage geographical data from Belize** (January-August 2006)
- Advisor to computer science M.Sc. student Diego Prina-Ricotti (Dipartimento di Informatica e Automazione, Università di Roma Tre) on his thesis project: **AstroDAS: Querying Astronomical Databases Through a Distributed Annotation System** (January-September 2005)

## Education

### University of California, Santa Barbara

Ph.D. in Environmental Science and Management (Environmental Informatics),  
Bren School of Environmental Science and Management

### University of California, Berkeley

M.S. in Industrial Engineering and Operations Research

Includes applied Masters project work at **University of Nottingham, England**

### Stevens Institute of Technology, Hoboken NJ

B.E. in Electrical Engineering, with Honor

Includes an academic year at **University of Dundee, Scotland** (International Scholars Program)

Includes summer study at **University of Oxford, England** (International Graduate Summer School)

## Professional Sponsored Project Participation

### NIH Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative: Team-Research Brain Circuit Programs (U19)

Award NS107613-01, Miller (PI)

2018-2020

Understanding V1 circuit dynamics and computations

Role: Data Science Core Key Personnel

The goal of this 5-year U19 award was to build and validate dramatically improved models of visual cortical function and dynamics. The Data Science Core in part provided the infrastructure required to share and analyze data among the nationally distributed science project sites.

Award NS104649-01, Costa (PI)

2017-2020

Computational and circuit mechanisms underlying motor control

Role: Data Science Core Lead

The aim of this 5-year U19 award was to understand the functional and computational logic of connectivity between motor control centers, the motor cortex, and the spinal cord and muscle. The

Data Science Core in part led multiple science projects in the use of best practices, standards, tools, workflows, and computational infrastructures to manage, share and disseminate research-related data.

### Other NIH Projects

**Award 5R24HD056691-08, Hirsh (PI)** **2013-2018**  
**Columbia-Vietnam Social Science Training and Research Partnership: STAR II**

Role: Co-investigator

This project involved building the capacity of the Vietnamese social science research community through activities including improving computing infrastructure to support research and developing a health data repository.

**Award 1G20RR030893-01, Purdy (PI)** **2009-2013**  
**Columbia University Core Research Computing Facility**

Role: Manager for HPC Research Cluster and Research Storage sub-projects within award

Secondary goals of this NIH Research Facility Improvement Grant were to consolidate computational resources and improve data storage options for NIH funded research groups.

## Teaching

**Green IT: Paradox and Practice** **Fall 2010**

Five-week evening course offered as part of the Columbia Center for Environmental Research and Conservation (CERC) Certificate program in Conservation and Environmental Sustainability. Topics included data center energy consumption and green information technology (IT) practices: the growth in the use of computing and in society demands more resources and energy, yet also allows us to understand and solve environmental problems.

## Selected Papers, Reports and Presentations

Listed chronologically. Refereed/peer reviewed papers and presentations are preceded by an asterisk.

### Related to Professional Activities at Columbia University

- \*R. Bose, A. Antoniadis, J. Pellman. **Research Computing Infrastructure and Researcher Engagement: Notes from Neuroscience**, presented at the Practice and Experience in Advanced Research Computing (PEARC '20) Conference. (July 2020).
- R. Bose and B. Scap. **Research Data Storage for Columbia's Zuckerman Mind Brain Behavior Institute**, an experience/position paper for the Workshop on Research Data Management Implementations, Arlington, VA. (September 2017).
- R. Bose. **Mind, Brain and Behavior: Computing and Discovery**, presentation at the UK High Performance Computing Special Interest Group (HPC-SIG) meeting, University of Leeds, Leeds, England. (February 2017).
- R. Bose. **Mind, Brain and Behavior: Computing and Discovery**, invited talk at Arizona State University, Tempe AZ. (September 2016).
- \*R. Bose. **Implementing a Secure Data Enclave with Columbia University Central Resources**, presented at the International Association for Social Science Information Service and Technology (IASSIST 2013) Conference, Cologne, Germany. (May 2013).

- Assistance with: A. Crosswell and V. Hamilton. **Columbia University Advanced Concepts Data Center Pilot**, Final Report prepared for the New York State Energy Research and Development Authority, Albany, NY. (April 2013).
- R. Bose and A. Nurnberger. **Columbia's Evolving Research Data Storage Strategy**, an experience/position paper for the Workshop on Research Data Management Implementations, Arlington, VA. (March 2013).
- G. Almes et al. **What's Next for Campus Cyberinfrastructure? ACTI Responds to the NSF ACCI Reports**, EDUCAUSE Advanced Core Technologies Initiative (ACTI) Report. (July 2012).
- R. Bose and D. Mizzy. **Research Data Storage Approaches at Columbia**, a position paper for the Workshop on Research Data Lifecycle Management, Princeton University, Princeton NJ. (July 2011).
- R. Bose, A. Crosswell, V. Hamilton and N. Mesa. **Piloting Sustainable HPC for Research at Columbia**, a position paper for the Workshop on Sustainable Funding and Business Models for Academic Cyberinfrastructure (CI) Facilities, Cornell University, Ithaca, NY. (May 2010).
- Maximizing the Reach of a Graduate Research Journal through Open Source Tools and Social Media**, presented at the 2nd International Public Knowledge Project (PKP) Scholarly Publishing Conference, Vancouver, BC, Canada. (July 2009).
- Extending the Reach of Academic Research in the Digital Age**, invited presentation at a Special Seminar on Scholarly Communication of Scientific Data, Lamont Campus, Columbia University. (March 2009).
- \*R. Downs, R. Chen, R. Cartolano, and R. Bose. **Collaborative Establishment of a Long-Term Archive for Stewardship of Interdisciplinary Scientific Data**, presented at the American Geophysical Union 2008 Fall Meeting (AGU 2008), San Francisco, CA. (December 2008) (EOS Transactions of the AGU, 89 (53), Fall Meeting Supplement, Abstract U23A-0047)
- R. Bose. **Realizing the Research Library - Data Center Alliance**, invited presentation at the Geoscience Information Society 2008 Annual Meeting, Houston, TX. (October 2008) (Libraries in Transformation: Exploring Topics of Changing Practices and New Technologies, Vol. 43, Proceedings of the Geoscience Information Society, October 5-9, 2008, Houston, TX, 11-14)

## **Related to Doctoral and Postdoctoral Research**

- Tracking data provenance: some recent approaches**, presented at National Oceanic and Atmospheric Administration (NOAA) National Geophysical Data Center, Boulder, CO. (March 2008)
- Socioeconomic Data and Applications Center (SEDAC) Faceted Browsing Demonstration**, Visiting Scientist report submitted to Center for International Earth Science Information Network (CIESIN), Lamont Campus, Columbia University. (November 2007)
- Towards CI4EI success: lessons from UK e-Science initiatives**, presented at Cyberinfrastructure for the Earth Institute (CI4EI) meeting, Lamont Campus, Columbia University. (September 2007)
- \*R. Bose and G. McGarva. **Safeguarding the Citation Lifecycle for Global Geospatial Repositories**, presented at the European Geosciences Union 2007 General Assembly (EGU 2007), Vienna, Austria. (April 2007) (Geophysical Research Abstracts, Volume 9, Abstract EGU2007-A-08458)
- \*R. Bose and G. McGarva. **Citing geospatial feature inventories with XML manifests**, presented at the American Geophysical Union 2006 Fall Meeting (AGU 2006), San Francisco, CA.

(December 2006) (EOS Transactions of the AGU, 87 (52), Fall Meeting Supplement, Abstract IN54A-06)

\*R. Bose, P. Buneman and D. Ecklund. **Annotating scientific data**, presented at the Fifth UK e-Science All Hands Meeting (AHM 2006), Nottingham, England. (September 2006)

\*R. Bose and J. Frew. 2005. **Lineage Retrieval for Scientific Data Processing: A Survey**. ACM Computing Surveys, Volume 37, Issue 1 (March 2005), 1-28.

## **Citizenship**

U.S. Citizen