Sharad V. Oberoi, PhD

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SUMMARY OF QUALIFICATIONS

- Proactive, performance-driven researcher with 5+ years' progressive expertise in leadership and problem solving for geospatial firms and academia.
- Avid learner experienced in building robust real-world autonomous robotic systems, with high commitment to continued education.
- Genuine team player with excellent project management, multi-tasking and communication skills.

AREAS OF EXPERTISE

- Machine Learning
- Data Analysis
- Statistics
- Remote Sensing
- Geospatial Information Systems
- Database Systems
- Robotics
- Spatial Analysis

CAREER PROGRESSION

2015-	Director of IT & Software Engineering, The Sanborn Map Company, Inc.
2013-15	Technical Development Manager, The Sanborn Map Company, Inc.
2012-13	Visiting Research Scientist, The Robotics Institute, Carnegie Mellon University
2010-11	IT Specialist-Server/Network Support Team, Urban Education Institute, The Univ of Chicago
2009-10	Linux Administrator, Civil & Environmental Engineering, Carnegie Mellon University
2005-10	Graduate Research Assistant, Civil & Environmental Engineering, Carnegie Mellon University
2006, 2008	Intern, Facilities Management Services, Carnegie Mellon University
2004	Summer Intern, Snow and Avalanche Study Establishment, DRDO, Chandigarh, India

RESEARCH EXPERIENCE

- **Semi-automated indoor mobile mapping using multi-sensor data fusion**
  - Completed design and development of a semi-autonomous indoor mobile mapping robot called SPIN.
  - SPIN combines 2D SLAM based on the integration of laser scans in a planar map (using scan-matching) with a multitude of sensors and actuators to perceive the environment and interact with it.
  - Outputs include 2D floor plan, 3D LiDAR point cloud of the scanned area and a topological map.
- **Analyzing Collaborative Team Practices through Online Multi-player Games**
  - Co-developed an online version of Delta Design, a board game used to teach design collaboration skills.
  - Since every state of the shared virtual board, along with micro-level team performance and chat are captured, the resulting corpus provides a rich resource to explore collaborative team practices.
  - Observations of the board-moving tactics show that teams planning a strategy before starting the game or players sharing details about their role's constraints do not have much effect on the game's outcome.
- **ADEPT - Assessing design engineering project classes with multi-disciplinary teams**
  - Lead PhD student on an NSF-funded project to address the problem of information management in engineering design projects by using computational linguistics.
  - Developed a research prototype to aggregate the documents and student discussion threads to extract an interactive graphical representation (called DesignWebs) for navigating the project corpus.
  - The research has implications for design learning by allowing researchers to understand how the underlying structure of the artifact changes as the project progresses.
- **Population-centric counterinsurgency as seen through the Iraq War Logs**
  - Devised and implemented an assessment model for measuring the success of population-centric counterinsurgency (COIN) in Iraq by using machine learning approaches on the Iraq War Logs.
  - The analysis demonstrates that the COIN campaign did not succeed in achieving its goals .
  - The research had implications for the ongoing US strategy in Afghanistan that relied on the Iraq War as a successful counterinsurgency model.

PROFESSIONAL HIGHLIGHTS

- **Director of IT & Software Engineering**, The Sanborn Map Company, Inc.   2015-
    - Responsible for supervising the IT, Software Development and 3D visualization teams.
    - Manage Sanborn's 3D City Modeling products line and software solutions including web development, workflow automation, cloud migration and decision support systems.
    - Prepare and monitor a disaster recovery plan, including backups of servers and web-services.
    - Be involved in the planning process to enhance the solution through technology, identify potential risk areas based on various factors such as timeline, budget, and technology constraints.
    - Create technical architecture and design to meet the project requirements and client infrastructure.
    - Support in evangelizing technology offerings, initiatives, and principals both within the Software Development group and other disciplines.
    - Research emerging technologies and develop solutions that will help sell innovative ideas to clients.

- **Technical Development Manager**, The Sanborn Map Company, Inc.   2013-15
    - Designed and developed the SPIN robot independently as Principal Engineer during 2013.
    - Transitioned to the role of Product Manager in 2014 and expanded focus from the physical robot to the ecosystem around it, including supporting sales, training field technicians, and creating QA/QC processes.
    - Managed the 3D visualization and software development teams since late 2014, comprising of 6 developers.

EDUCATION

PhD	Carnegie Mellon University, Pittsburgh, Pennsylvania Civil & Environmental Engineering *Dissertation*: Towards a framework to support engineering design student projects	2011
MA	The University of Chicago, Chicago, Illinois International Relations *Thesis*: Population-centric counterinsurgency as seen through the Iraq War Logs	2011
MS	Carnegie Mellon University, Pittsburgh, Pennsylvania Civil & Environmental Engineering *Thesis*: Functional Requirements for CAD and GIS integration	2006
B Tech	Indian Institute of Technology, Banaras Hindu University, Varanasi, India Civil Engineering	2005
UG Diploma	Faculty of Arts, Banaras Hindu University, Varanasi, India German Studies	2004

COMPUTER SKILLS

- Google Qualified Cloud Platform Developer
- Proficient in Python
- Proficient with software development on Linux, some experience on Windows
- Experienced with OpenCV, ROS, PCL, QML
- Experienced with Javascript/HTML/CSS, some experience with Java and C++
- LaTeX, Microsoft Office

PATENTS

Russell, JD, Oberoi, SV and Copple, JR, "Quick-EST and 3D Quick-EST property estimation technology and reports." *(Pending)*

SELECT PUBLICATIONS

JOURNALS

2011	Kumar, B, and Oberoi, SV, "Aspects of legislative cognizance of noise pollution in India," *Journal of Environmental Science & Engineering*, 53 (2), April, pp. 219-226, 2011.
2004	Oberoi, SV, "Nurturing the timeless profession of civil engineering: A case study of Summer Camp @ IIT-Kanpur," *Indian Concrete Institute Journal*, 5 (1), April-June, pp. 37-39, 2004.

BOOK CHAPTERS

2009   Kumar, B and Oberoi, SV, "Noise pollution: Legislative aspects and concerns," in P. Mohan (Ed.): *Noise Pollution & Environmental Concern*, Amicus Books, ICFAI University, Hyderabad, India, pp. 12-38, 2009 (Invited Chapter).

REFEREED CONFERENCE PROCEEDINGS

2013   Oberoi, SV, Finger, S and Rosé, E, "Online implementation of the Delta Design game for analyzing collaborative team practices," *ASME 10th International Conference on Design Education (DEC) 2013*, Portland, Oregon, August 4-7, 2013. [**Best Paper Award**]

2012   Oberoi, SV and Finger, S, "Tracking design knowledge in engineering student projects around course milestones," *119th ASEE Annual Conference 2012*, San Antonio, Texas, June 10-13, 2012.

2010   Oberoi, SV, Nguyen, D, Finger, S and Rosé, CP, "Automatic extraction of conceptual maps from design team documents," *7th Symposium on International Design and Design Education (DEC)*, Montreal, Canada, August 15-18, 2010.

2009   Oberoi, SV and Finger, S, "Interactive design navigational tools," *6th Symposium on International Design and Design Education (DEC)*, San Diego, California, August 30-September 2, 2009.

2009   Oberoi, SV and Finger, S, "DesignWebs: An interactive organizational memory assimilation and navigation tool," *17th International Conference on Engineering Design*, Stanford, California, August 24-27, 2009.

2009   Oberoi, SV and Finger, S, "DesignWebs: Towards the creation of an interactive navigational tool to assist and support engineering design learning," *116th ASEE Annual Conference & Exposition 2009*, Austin, Texas, June 14-17, 2009.

2005   Oberoi, SV and Thakur, NK, "Disaster preparedness in the hills: natural hazard modeling using GIS and remote sensing," *Proceedings of the 2005 ASCE International Conference on Computing in Civil Engineering*, Cancun, Mexico, July 12-15, 2005.

2005   Oberoi, SV, Ohri, A, Singh, L and Gaurav, "Solid waste management (SWM) in Varanasi city using geographic information systems," *Map India 2005*, New Delhi, India, February 7-9, 2005.

2005   Oberoi, SV and Thakur, NK, "Risk Evaluation of Hill Road using Remote Sensing and GIS based Models," *International Conference on Structural & Road Transport Engineering (START) 2005*, Indian Institute of Technology Kharagpur, India, pp. 886-893, January 3-5, 2005.

2004   Oberoi, SV and Thakur, NK, "Generation of disaster management model based on GIS and remote sensing," *Third International Conference on Theoretical, Applied, Computational and Experimental Mechanics*, IIT Kharagpur, India, pp. 295-298, December 28-30, 2004.

2004   Oberoi, SV and Thakur, NK, "Prioritization of a mountainous area for natural hazards using remote sensing and GIS," *25th Asian Conference on Remote Sensing (ACRS)*, Chiang Mai, Thailand, November 22-26, 2004.

2004   Oberoi, SV and Thakur, NK, "Temporal remote sensing data and GIS application in avalanche and landslide hazard analysis of Manali-Leh Highway," *Map Asia 2004*, Beijing, China, August 26-29, 2004.

2004   Oberoi, SV, and Thakur, NK, "Safety assessment of existing road in the Himalayas using geographic information system and satellite imagery," *Proceedings of Third International Symposium on New Technologies for Urban Safety of Mega Cities in Asia*, Agra, India, pp. [Poster Session] 11-20, October 18-19, 2004.

2003   Binyala, V, Oberoi, SV and Rao, KS, "Detection and analysis of growth of sea-ice using MSMR brightness temperature data," *Map India 2003*, New Delhi, India, January 28-31, 2003. [**Best Student Paper Award**]

PUBLISHED ABSTRACTS

2010   Oberoi, SV, Nguyen, D, Gweon, G, Finger, S, and Rosé, CP, "DesignWebs: A tool for automatic construction of interactive conceptual maps from document collections," in V Aleven, J Kay, and J Mostow (Eds.): *Proceedings of the 10th International Conference on Intelligent Tutoring Systems, Part II*, LNCS 6095, pp. 387–389, Pittsburgh, Pennsylvania, June 14-18, 2010.

WORKSHOPS

2004   Kumar, B, Oberoi, SV and Goenka, A, "A brief review of the legislative aspects of noise pollution," *Proceedings of Workshop on Environmental Pollution: Perspectives and Practices*, organized by Institute of Engineering & Technology, Lucknow, India, April 30, pp. 53-65, 2004.

2003   Binyala, V, Oberoi, SV and Rao, KS, "Monitoring and assessment of sea-ice using IRS-P4 BTD," *Symposium on Advances in Microwave Remote Sensing Applications*, Indian Institute of Technology Bombay, Mumbai, India, January 21-23, 2003.

TALKS/POSTERS

2015   Oberoi, SV, Agarwal, S, and Tilley, B (2015), "Semi-automated extraction of 3D buildings for the City of Boulder," *Esri 3D Mapping Forum 2015*, 18-21 July 2015, San Diego, California.

2015   Agarwal, S, and Oberoi, SV (2015), "Semi-autonomous mobile laser scanning of building interiors," *International LiDAR Mapping Forum 2015*, 23-25 February 2015, Denver, Colorado.

2010   Oberoi, SV and Staisch, M, "What was the Surge? Tracking U.S. counterinsurgent tactics in Baghdad and Anbar Province," *ISA Annual Convention 2013*, San Francisco, California, April 3-6, 2013.

2010   Oberoi, SV, "DesignWebs: Learning in engineering project teams," *Advanced Infrastructure Systems Seminar*, Civil & Environmental Engineering, Carnegie Mellon University, Pittsburgh, Pennsylvania, March 19, 2010.

2010   Oberoi, SV, Nguyen, D, Finger, S, and Rosé, CP, "Capturing group knowledge through concept maps from design documents," *Innovation with Impact Exhibit*, Carnegie Mellon University, Pittsburgh, Pennsylvania, April 8, 2010.

2009   Oberoi, SV and Finger, S, "DesignWebs: Towards creating an interactive organizational memory assimilation and navigation tool," *Innovation with Impact Exhibit*, Carnegie Mellon University, Pittsburgh, Pennsylvania, April 3, 2009.

2006   Oberoi, SV, Leite, FL, Akinci, B, Garrett, Jr, JH, and Akin, O, "Integrated approach for interpreting and fusing building and mobile sensor streams in a facility into high-level information," *Institute for Complex Engineered Systems (ICES) Open House*, Carnegie Mellon University, Pittsburgh, Pennsylvania, April 25, 2006.

2005   Oberoi, SV, Akinci, B, and Karimi, HA, "CAD/GIS integration through semantic interoperability," *Institute for Complex Engineered Systems (ICES) Open House*, Carnegie Mellon University, Pittsburgh, Pennsylvania, Nov 2, 2005.

POPULAR MEDIA

2014   Oberoi, SV, Agarwal, S, and Copple, JR, "Behind Sanborn's indoor mapping initiative," *LiDAR News Magazine*, 4(5):34-38, 2014.

2014   Oberoi, SV, Agarwal, S, and Copple, JR, "Mapping building interiors automatically," *Geospatial World*, August, 2014, pp. 62-63.

Complete list of publications available at Google Scholar.

HONORS AND AWARDS

2013   Best Paper Award at the 10th ASME Intl Conference on Design Education, Portland, Oregon
2010   The University of Chicago Unendowed Scholarship

2009	Fenves Travel Grant, Carnegie Mellon University
2007	Carnegie Institute of Technology Dean's Fellowship
2005	JN Tata Scholarship for graduate studies at Carnegie Mellon University
2004	The Institution of Engineers (India) Gold Medal in Civil Engineering
2003	Best Student Paper Award at Map India 2003, New Delhi, India
1998	National Talent Search (NTSE) Scholarship for high school and undergraduate studies

LEADERSHIP

2010-11	Member, Student Government Cabinet, The University of Chicago
2010-11	Student Representative, Social Sciences GSA Committee, The University of Chicago
2010	Organizing Committee Member, Civil & Environmental Engineering Talent Show, CMU
2006-11	President, Advisory Committee Member, Indian Graduate Students' Association, CMU
2008-10	CEE Student Representative, Graduate Students Assembly, Carnegie Mellon University
2003-04	Executive Committee Member, Civil Engineering Society, IIT-BHU

REFERENCES

Available upon request.

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