

SANISH RAI

Curriculum Vitae

Assistant Professor
Department of Computer Science and Information Systems
West Virginia University Institute of Technology
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AREA OF INTEREST

Simulation and modeling, Sequential Monte Carlo methods, Data assimilation, Agent based, Graph based models.

EDUCATION

PhD in Computer Science December 2016
Georgia State University, Atlanta, GA
Dissertation title: "Building Occupancy Simulation and Data Assimilation using a Graph based Agent Oriented Model"
Committee: Xiaolin Hu (Chair), Rajshekhar Sunderraman, Yichuan Zhao, Ying Zhu

MSc in Computer Science 2014
Georgia State University, Atlanta, GA

BE in Computer Engineering 2008
Institute of Engineering, Kathmandu, Nepal

TEACHING EXPERIENCE

Assistant Professor January 2017- Present
West Virginia University Institute of Technology

Responsibilities: Teaching the class with full responsibility, creating syllabus, planning course content, managing content online, creating assignments, quiz and exams, conducting labs along with the lab contents, maintain office hours, providing immediate feedback on student work and evaluating students.

- Computer Science 122 (Credit Hours: 4) Spring 2017
- Discrete Mathematics (Credit Hours: 3) Spring 2017
- Computer Science 121 (Credit Hours: 4) Fall 2017
- Artificial Intelligence (Credit Hours: 3) Fall 2017

Graduate Teaching Assistant August 2011 – December 2016
Georgia State University

Role: Instructor

Responsibilities: Teaching the class with full responsibility

- Introduction to Computer Science (Credit Hours: 4, Enrollment: 24) Spring 2013
- Principles of Computer Science I (Credit Hours: 4, Enrollment: 68) Fall 2016

Role: Instructor-Assistant

Responsibilities: Working as assistant to the main instructor, teaching certain sections of lecture, managing TAs for 5 sections, preparing assignments and lab works.

- Principles of Computer Science II (Credit Hours: 4, Enrollment: 118) Fall 2015

Role: Lab Instructor

Responsibilities: Preparing experiments, delivering lectures, teaching hands on programming, monitoring student's progress, grading lab reports, assisting students to excel in course.

- Principles of Computer Science II (Credit Hours: 4, Enrollment: 20) Fall 2013
- Theoretical Foundations of Computer Science (Credit Hours: 3, Enrollment: 25) Summer 2015
- Data Structures (Credit Hours: 3, Enrollment: 19) Spring 2016
- Computer Architecture (Credit Hours: 4, Enrollment: 30) Summer 2016

Role: Teaching Assistant

Responsibilities: Grading assignments and exams, providing tutorials and discussion sessions to assist students for various courses, managing online materials.

- Introduction to Computer Science (Credit Hours: 4, Enrollment: 35) Spring 2012
- Introduction to Computer Science (Credit Hours: 4, Enrollment: 65) Fall 2012
- Principles of Computer Science II (Credit Hours: 4, Enrollment: 26) Spring 2014
- Principles of Computer Science I (Credit Hours: 4, Enrollment: 75) Fall 2014

RESEARCH EXPERIENCE

Dynamic Data Driven Occupancy Simulation:

- Implemented Sequential Monte Carlo method to assimilate the sensor data.
- Modeled dynamic data driven simulation using the real time sensor data and graph based agent oriented model to predict the occupancy simulation in real time.
- Used Genetic Algorithm to improve occupancy prediction

Hybrid model for building occupancy estimation

- Created a hybrid model to simulate occupants with different levels of complexity
- Used the model to assimilating video sensor data for simulating large number of occupants

Graph Based Agent Oriented Model

- Created an efficient simulation model for building occupancy simulation.
- Successfully performed simulation for huge number of occupants in large building structure.

Behavior Pattern Detection in Smart Homes:

- Used Sequential Monte Carlo Methods and Hidden Markov Model for human behavior prediction using sensor data.
- Detected various occupancy behaviors based on sensor data for a smart environment.
- Worked with binary data collected from motion sensors installed across the building.

PUBLICATIONS

- S. Rai, X. Hu, Data Assimilation With Sensor-Informed Resampling For Building Occupancy Simulation, Proc. 2017 Winter Simulation Conference, 2017.
- S. Rai, X. Hu, Graph based agent oriented model for tunnel simulation, COMPSAC 2016, Atlanta, Georgia, USA, 2016.
- S. Rai, M. Wang, and X. Hu. 2015. A graph-based agent-oriented model for building occupancy simulation. In Proceedings of the Symposium on Agent-Directed Simulation (ADS '15). Society for Computer Simulation International, San Diego, CA, USA, 76-83.
- S. Rai, X. Hu, Behavior Pattern Detection for Data Assimilation in Agent-Based Simulation of Smart Environments, Proc. 2013 IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT-13), 2013.
- X. Hu, S. Rai, X. Wang, Activity-informed Dynamic Data Driven Simulation, ACTIMS 2012 – Activity-Based Modeling & Simulation 2012, ITM Web of Conferences, Vol. 1 (2013), 2013.

PRESENTATIONS IN REFEREED CONFERENCES

- S. Rai, X. Hu, Graph based agent oriented model for tunnel simulation, COMPSAC 2016, Atlanta, Georgia, USA, 2016
- S. Rai, X. Hu, Behavior Pattern Detection for Data Assimilation in Agent-Based Simulation of Smart Environments, Proc. 2013 IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT-13), 2013.

SERVICE

Professional

- Journal reviewer of “SIMULATION: Transactions of the Society for Modeling and Simulation International”
- Conference reviewer of “ICTAI 2016: The annual IEEE International Conference on Tools with Artificial Intelligence (ICTAI)”

Activities

- Volunteer: IEEE International Conference on Big Data and Cloud Computing (BDCloud 2016), Social Computing and Networking (SOCIALCOM 2016), Sustainable Computing and Communications (SustainCom 2016)
- Volunteer: IEEE Computer Society International Conference on Computers, Software & Applications (COMPSAC 2016)
- Member: Georgia State University, IEEE Student Chapter
- Member: Georgia State Student Chapter of ACM

AWARDS

- Brains and Behavior Fellowship, Georgia State University 2013-2016
- Merit Award, Full Scholarship, IOE Pulchowk Campus, Nepal 2004-2008

PROFESSIONAL WORK EXPERIENCE

Software Engineer Oct 2010 – Jul 2011

Himalayan Bank Limited, Kathmandu, Nepal

- T24 Banking Software:
- Designed and development web-based module for phone payment in T24 banking system.
- Implemented secure online banking system using ARC-IB in T24 and also performed extraction of raw data based on user requirements from archives.

Software Engineer Mar 2009 – Feb 2010

E&T Development Center, Kawaguchi, Japan

- Software for Image Analysis:
- Lead a team of 5 in a research project to develop software to aid in the detection of cancer in bronchial tube sponsored by the Cancer Research Team of Japan.
- Created image analyzing filters for detection of required regions from input data.
- Software for Glass Lens Analysis:
- Lead a team of 3 to develop software for modeling and analyzing Glass-Lens.
- Collaborated with industry specialists for analysis of simulation data of Glass.

Software Engineer Mar 2008 – Feb 2009

E&T Development Center, Kathmandu, Nepal

- Graph Generator Software:
- Developed a financial visualization software using VBA.
- Enterprise Solution for Small Businesses:
- Developed a web-based Enterprise Resource Planning (ERP) solution that integrates inventory information system and human resource information system.