SUMAN PANERU

801 Shamrock Ave Apt A, State College, PA-16801
sbp5863@psu.edu
+1 814 769 3458

Vision

I am passionate about climate resilience, sustainable cities, and the technology driving them towards carbon neutrality.

Research Interests

Building Physics, Thermal Resilience, Decarbonization, Machine Learning

Education

PhD in Architectural Engineering **Aug 2023 - May 2026**
Penn State University, State College, PA GPA: 3.83/4.0

Master of Technology Management **Aug 2015 - May 2017**
Bowling Green State University, Bowling Green, OH GPA: 4.0/4.0

Bachelor of Architecture **Jan 2009 - Dec 2014**
Tribhuvan University, Institute of Engineering Lalitpur, Nepal, 79.93%

Skills

Programming: Python, R
Load/Energy Modeling: Trace3D, IES/VE, EnergyPlus, Open Studio
3D Modeling/Coordination : Revit, Auto CAD, Sketch up, Navisworks
Analog: Concrete works, Carpentry, Metalworking, Wood working, Drafting

Honors and Awards

Building Science Scholarship, RDH July 2024
Building Science Scholarship, RDH Dec 2023
University Graduate Fellowship, Penn St University Aug 2023
H. Marcus Dean's Chair College of Eng Scholarship,Penn St Uni Aug 2023
Marlene and Joseph Borda Fellowship,Penn St Uni Aug 2023
Helen and Barney Wood Scholarship, Bowling Green St Uni Aug 2016
The College Fellowship, Tribhuvan University,IoE, Pulchowk Campus Jan 2009

Research Experience

Research Fellow, Penn State University, State College, PA **Aug 2023 - Present**

- Designed and implemented a hardware-in-the-loop testing framework to optimize and retune building systems, integrated Proportional (P), Proportional-Integral (PI), and Proportional-Integral-Derivative (PID) controllers to enhance HVAC system performance
- Developed an experimental methodology using a controlled thermal chamber to evaluate and validate the thermal performance of building envelopes by simulating real-world environmental conditions through varying temperature and humidity settings
- Conducted literature reviews, collected data, analyzed results, authored manuscripts, and prepared progress reports for the Thermal Resilience project funded by the National Science Foundation

Summer Intern, Lawrence Berkeley National Laboratory , Berkeley, CA May 2024 - Aug 2024

- Developed a heatwave detection algorithm for all ASHRAE climate zones and used it to evaluate thermal resilience performance during heatwaves
- Developed a standard dataset of extreme temperature events for assessing thermal resilience of buildings
- Designed occupant types based on energy usage behavior, activity levels, and occupancy schedules for updating EnergyPlus and OpenStudio SDK toolkit

Research Assistant, University of Florida, Gainesville, FL May 2020 - Oct 2020

- Conducted literature reviews, collect data, analyze results, write manuscript, prepare progress report for the cyber infrastructure Service for IoT-Based Construction Research and Applications project funded by National Science Foundation

Industry Experience

MEP Engineer, Turner Construction, Des Moines, IA Oct 2020 - Jul 2023

- Led the Turner mechanical project team, subcontractors, owner's consultants, and representatives to ensure efficient system design, coordination, and installation based on mechanical drawings.
- Managed the RFI, submittals, and shop drawings process for the mechanical and plumbing scope of the project.
- Oversaw mechanical project start-up, testing and balancing, and various phases of commissioning, from L1 (factory inspection test) to L5 (system integrated test).
- Acted as a liaison with A/EoR, subcontractors, inspectors, Turner job staff, and owner's representatives.
- Prepared contract documents for both dry and wet mechanical systems.
- Managed budget and change orders pertaining to Mechanical systems.

VDC Engineer, Turner Construction, Des Moines, IA Apr 2019 - May 2020

- Utilized Navisworks for multidisciplinary coordination of Mechanical, Electrical, Plumbing, and Fire Protection (MEPF) systems, focusing on routing and spatial optimization.
- Led 3D virtual trade coordination meetings and conducted constructability reviews.
- Developed Building Information Modeling execution plan, schedule, and digital project delivery documents.
- Responsible for Laser Scanning and analysis of QA/QC data to track construction progress.

Engineer, Turner Construction, Des Moines, IA Jun 2018 - Apr 2019

- Coordinated with Mechanical and control contractors for the efficient system installation
- Managed RFI, Submittals, and Change Orders related to building mechanical and control system..

Project VDC Coordinator, SSOE Group, Toledo, OH **May 2017 - May 2018**

- Executed 3D model coordination for complex projects in the design phase.
- Developed and implemented Lean construction techniques in Design-Build projects with Clients, Architects, General Contractors, and Subcontractors.
- Developed BIM Execution Plan and provided direction on projects.
- Responsible for Laser Scanning and analysis of QA/QC data for coordination in renovation projects.

Teaching Experience

Teaching Associate, BGSU, Bowling Green, OH **Aug 2016 - May 2017**

- Prepared and delivered Lectures to undergraduate Construction Management students for CONS 3350- Construction Material and Testing.
- Supervised Material Lab for the testing of building materials: concrete, aggregates, soils, and steel as per ASTM standards.
- Overall **Student Teaching Review - 4.5/5.0** is obtained.

Teaching Assistant, BGSU, Bowling Green, OH **Aug 2015 - May 2016**

- Teaching Assistant for CONS 3350 - Construction Material and Testing.
- Teaching Assistant for CONS 6420- Construction Program Management.
- CONS 4350- Construction Methods and Practices.

Publications

Note : J represents Journal Articles, B represents Book Chapters, and C represents Conference Proceedings.

Journal Articles

- **J06 Paneru S.**, Suh S., Kandel A., Seo W., & Rausch C. (2024). Evaluating the Decarbonization Potential of Industrialized Construction: A Review of the Current State, Opportunities, and Challenges. *Journal of Construction Engineering and Management,Volume 150, Issue 9* [Online]
- **J05 Paneru S.**, Ghimire P., Kandel A., Kafle S., & Rausch C. (2024). Embodied residential building carbon emissions reduction in Nepal using linear optimization modeling. *Journal of Building Engineering, 108531.* [Online]
- **J04 Paneru S.**, Ghimire P., Kandel A., Thapa S., Koirala N., & Karki M. (2023). An Exploratory Investigation of Implementation of Building Information Modeling in Nepalese Architecture–Engineering–Construction Industry. *Buildings, 13*(2), 552. [Online]
- **J03 Paneru S.** and Jeelani I. 2021. Computer Vision Applications in Construction: Current State, Opportunities & Challenges. *Automation in Construction, 132*, p.103940.[Online]
- **J02** Dhakal R., Sedai A., **Paneru S.**, Yosofvand M., and Moussa H. 2021. Towards a Net Zero Building Using Photovoltaic Panels: A Case Study in an Educational Building. *International Journal of Renewable Energy Research (IJRER), 11*(2), pp.879-889.[Online]
- **J01 Paneru S.**, Foroutan Jahromi F., Hatami M., Roudebush W., and Jeelani I. 2021. Integration of Emergy Analysis with Building Information Modeling. *Sustainability, 13*(14), p.7990.[Online]

Peer-reviewed Conference Proceedings

- **C03 Paneru S.**, Feng Y., Xia C., Hu Y., and Wang J. An Exploratory Investigation of Social Vulnerability from the Building Resilience Perspective. In *Construction Research Congress 2024* (pp. 156-164).[Online]
- **C02** Hatami M.,**Paneru S.**, and Flood I. Applicability of Artificial Intelligence (AI) Methods to Construction Manufacturing: A Literature Review. In *Construction Research Congress 2022* (pp. 1298-1306).[Online]
- **C01** Hatami M., Franz B., **Paneru S.**, and Flood I. Using Deep Learning Artificial Intelligence to Improve Foresight Method in the Optimization of Planning and Scheduling of Construction Processes. In *Computing in Civil Engineering 2021* (pp. 1171-1178).[Online]

Volunteering

Mentor, ACE Mentor Program of America, Des Moines, IA **Nov 2020 to Mar 2021**

- Mentored high school students in Central Iowa to encourage them to choose a career in the AEC industry.

Treasurer, Graduate Student Senate, Bowling Green, OH **Mar 2016 to Mar 2017**

- Distributed USD 60K budget to support graduate student activities for professional development as Treasurer of the largest student organization on campus.

Earthquake Engineer, SP Architects, Kathmandu **Apr 2015 to Jun 2015**

- Actively involved in rescue missions, fundraising, and relief distribution after the 2015 earthquake.
- Conducted Rapid Visual Assessments and Non-Destructive Tests of residential buildings.
- Trained the local community to build temporary settlements in rural Nepal and volunteered to demolish and dismantle earthquake-affected buildings.

Assistant Architect, Rural Reconstruction, Chitwan **Oct 2013 to Jan 2014**

- Assessed two school buildings in the marginalized village of Nepal to recommend how to upgrade new buildings as green schools.
- Assisted with the proposal of the redevelopment action plan, project estimation, and costing of the project.

Leadership

- Treasurer, Graduate Student Senate, BGSU Aug 2016-May 2017
- Senator, College of Technology, BGSU Aug 2016-May 2016
- Member, United Nations Youth and Student Association of Nepal – UNYSAN 2015

Professional Services

Reviewer

- Renewable Energy: Impact Factor = 9.0
- Journal of Building Engineering : Impact Factor = 6.7
- Building & Environment: Impact Factor = 7.1
- Journal of Construction Engineering and Management: Impact Factor = 4.8
- Sustainability: Impact Factor = 3.8
- Building: Impact Factor = 3.1

Newspaper Coverages

- Reducing residential carbon emissions: An opportunity for Nepal - [Online]
- This is how a national project should be built - [Online]
- Infrastructure: local materials or concrete? - [Online]

Languages

- English, Nepali, Hindi, German

Extra Curricular Activities

- Reading, Writing, Hiking