Manish Neupane

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EDUCATION

South Dakota State University (SDSU) **August. 2021 - Present**
Brookings, SD.

BS in Physics and BS in Computer Science
Expected Graduation: Spring 2026

Awards and Recognitions

- Outstanding student achievement in research, URSCAD – spring 2022, spring 2024
- Outstanding First year as Residential Assistant

Publications/Abstracts

- Parashu Kharel, Gavin Baker, **Manish Neupane** and Tula R Paudel, Investigation of MnBi-based Composite Magnets, *2023 APS March meeting abstract.*
- Parashu Kharel, Paul White, Gavin Baker, **Manish Neupane** and Tula R Paudel, Improving MnAl tetragonal phase stability through doping elements, *2024 APS March meeting abstract.*

Presentations

- **Manish Neupane**, Parashu Kharel, Matthew Flesche, and Tula R. Paudel, Investigation of MnX(X=Bi, Ga)-based composite magnets, URSCAD, SDSU, 2022. Poster Presentation.
- **Manish Neupane,** Gavin Baker, Tula R Paudel, and Parashu Kharel, Development of Manganese-based Exchange Coupled Magnets, URSCAD, SDSU, 2024. Poster Presentation.

Technical Skills & Professional Interests

- **Programming & Software**: Python, C/C++, MATLAB, JavaScript
- **Scientific Computing**: NumPy, SciPy, Pytorch
- **Software Engineering**: Git, React, Docker, REST APIs

Projects

Secure Path Optimization Platform
Full-stack React application for secure route planning with integrated ML-based risk scoring.

- Bult RESTful backend handling 10,000+ API requests during testing
- Implemented JWT authentication and encrypted data transmission
- Deployed Production-ready Docker containerized environment

Physics-informed Neural Networks for PDEs
Neural PDE solver embedding physical constraints directly into loss functions for better generalization on scientific problems.

- Achieved 25% speedup over classical finite-difference methods on nonlinear diffusion equation
- Implemented custom loss functions enforcing conservation laws during gradient descent
- Reduced compute time by 40% in lab material simulation Workflows

Automated Magnetometry Analysis Pipeline
End-to-end Python framework for batch processing VSM (Vibrating Sample Magnetometer) datasets in high-throughput materials discovery.

- Automated Data cleaning, curve fitting, and report generation for 500+ sample measurements
- Accelerated analysis cycle from 2 days to 4 hours-80% reduction
- Deployed in active Heusler alloy screening research at SDSU

Work Experience

Daktronics **May. 2024 –Present**
Internship- Product Assembly *Brookings, SD*

- Assembled electronic components for 100+ units per week, reducing defects by 10% through proactive inspections.
- Analyzed assembly data using statistical methods, providing insights that improved production efficiency by 20% and influenced project direction.
- Diagnosed and resolved hardware issues, implementing solutions that enhanced product reliability in a high-volume manufacturing environment.

South Dakota State University **Aug. 2021 –Present**
Undergraduate Research Assistant *Brookings, SD*

- Conducted research on MnBi-based composite magnets, analyzing crystal structures and magnetic properties using X-ray Diffraction (XRD), VersaLab magnetometer, and annealing techniques, contributing to advancements in sustainable material technologies for energy applications.
- Analyzed experimental data with Origin software, applying graphical and statistical methods to provide insights that improved project outcomes by 15%, influencing direction for battery and motor material development.
- Collaborated with a team of 5 researchers to design experiments, troubleshoot methodologies, and present findings at APS March meetings (2023, 2024), effectively communicating complex data to diverse audiences.

Society of Physics Students **January 2022 – Present**
Secretary and Tutor *Brookings, SD*

- Tutored 20+ undergraduate students per semester in physics courses (e.g., Quantum Mechanics, Electrodynamics), improving student grades by an average of 10%.
- Organized department events and guest lectures, increasing student engagement in physics-related activities by 25%.
- Demonstrated leadership by designing study plans to address diverse learning needs, fostering academic success.

Starship Technologies **January 2022 – May 2023**
Fleet Attendant *Brookings, SD*

- Managed a fleet of 10 autonomous food delivery robots at SDSU, optimizing operations to improve efficiency and user satisfaction by 15%.
- Performed hardware maintenance, troubleshooting sensors, motors, batteries, cameras, and GPS modules, ensuring 98% uptime for the robot fleet.
- Executed software maintenance using Python, including firmware updates and code modifications to resolve connectivity issues, enhancing system performance for real-time autonomous operations
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Soth Dakota State University **January 2022 – May 2022**
Residential Assistant *Brookings, SD*

- Supported a residential community of 50+ students within one of SDSU's 14 residential halls, fostering an inclusive and collaborative environment to enhance student well-being and academic success.
- Organized and facilitated 10+ community-building events per semester, including study groups, cultural celebrations, and wellness workshops, increasing resident engagement by 30%.
- Mediated conflicts and addressed resident concerns, resolving 90% of issues through active listening and strategic problem-solving, ensuring a safe and supportive living environment.