Amul Dhungel

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**SUMMARY**

Master’s student in Computer Science (4.0 GPA) with project level experience in HPC simulations, AI/ML pipelines, and full-stack application engineering and deployment. Deeply curious about applied and pure mathematics (calculus, number theory, chaos theory) as well as physics. I build lightweight software solutions to real-world problems. I started with intuitive understanding and now going with numbers from start.

**INTERESTS**

**• Applied Mathematics:** Exploring calculus, number theory, and chaos theory

**• Physics & Astronomy**: Independent readings in Theoretical physics and Cosmology.

**• Creative Programming:** Prototyping simple tools that address local needs.

**EDUCATION**

**Kentucky State University Jan 2024 - Present**

*Masters, Computer Science*

* **GPA:** 4.0
* **Coursework:** Advance Database Management System, Data Structures and Algorithm (C++), Software Engineering, Information System

**Islington College Aug 2018 - Jul 2021**

*Bachelor, Information Technology - (Hons)*

* **GPA:** 85.12%; WES Evaluation: 3.85
* **Coursework:** Operating Systems, Data Structures, Analysis Of Algorithms, Artificial Intelligence, Machine Learning, Networking, Databases

**EXPERIENCE**

**Kentucky State University Jan 2024 - Present**

*Graduate Research Assistant On-Site*

* Data Manipulation and Modeling: Conducted advanced data manipulation, geospatial data modeling, and data profiling using Python, increasing prediction model accuracy by 15% for crop production project.
* Mentoring and Program Facilitation: Mentored students during the SAP 24 program, ensuring 100% project completion.
* Temperature Data Analysis: Analyzed bee-hive temperature data using Python and 3D isosurface modeling, increasing tracking accuracy by 12%.
* ICPC 2024 Participation: Represented Kentucky State University in the ICPC (International Collegiate Programming Contest) 2024.
* 3D Thermographic Analysis of Temperature Variations in Bee Hives: Presented a poster titled "3D Thermographic Analysis of Temperature Variations in Bee Hives: Insights into Cluster Dynamics and Bee Health" at the Kentucky Academy of Science (KAS) conference.
* NASA EPSCOR: Currently working in Peridynamis simulaton in C++ to find the material surface erosion due to high velocity partical impact.

**Qualz-RA Jul 2023 - Jan 2024**

*AI Engineer Remote*

* Language Model Architectures: Designed GPT-based language models with LangChain and Hugging Face, improving platform response accuracy by 25%.
* Interactive Model Deployment: Implemented Gradio for real-time model testing, reducing testing time by 15%.
* NLP Workflows: Optimized NLP workflows using BERT and spaCy, increasing document classification accuracy by 18%.

**Ncell Jul 2022 - Mar 2023**

*Data Scientist On-Site*

* ETL Pipelines: Led ETL pipelines with Apache Airflow and SQL to enforce data quality rules and validation tasks, improving customer churn model accuracy by 16%.
* Big Data Analytics: Refactored real-time data architecture, reducing latency by 20% with Apache Kafka and Spark.
* Cloud AI Solutions: Optimized cloud solutions with AWS SageMaker, reducing storage costs by 12%.

**Wiseyak Inc. Jul 2022 - Feb 2023**

*Machine Learning Engineer On-site*

* Computer Vision Projects: Implemented vision models for medical imaging with TensorFlow and Keras, improving diagnostic accuracy by 14%.
* Consultation and Pipelines: Delivered expertise on model pipelines, reducing processing time by 15% through Apache Spark.

**RadScholars Jun 2022 - Mar 2023**

*Research Assistant Remote*

* Medical Imaging Models: Developed medical imaging models using Pytorch, increasing classification accuracy by 20%.
* ML Pipelines: Designed pipelines reducing false positives by 12%.

**Zummit Infolab Apr 2022 - Sep 2022**

*Data Scientist Remote*

* Use-Case Implementation: Led AI/ML war room sessions, improving model deployment by 15%.
* Vision and Depth Measurement: Integrated depth measurement with Python and PCL, reducing calibration errors by 10%.

**Jan 2021 - Jan 2022**

*Remote*

**Nov 2020 - Jan 2021**

**Xorb AI**

*Mobile Application Developer*

* App Development: Rebuilt mobile app with Flutter, improving functionality by 25%.
* ML Integration: Integrated ML models, increasing user engagement by 22%.

**Innovate Tech.**

*Backend Engineer*

* Platform Development: Developed backend features with Node.js, improving API response time by 10%.

**PROJECTS**

*Remote*

**NASA Kentucky Space Grant & EPSCOR 2024**

* Devloping and optimizing peridynamics model in high-performance computing and parallelization techniques using C++ and Bash to simulate deformation and crack over time due to high-velocity particle impacts.
* Helps in simulating material failure in aerospace applications, improving NASA's ability to ensure the reliability of materials in extreme conditions.
* This project contributes to safer spacecraft and satellite materials, reducing mission risks.

**Smart-Beehive Temperature Analysis 2024**

* Utilized Python, NumPy, and Matplotlib to design a smart beehive monitoring system, creating 3D isosurface models for visualizing temperature variations in real-time.
* Provided beekeepers with an advanced tool to monitor environmental conditions inside beehives, reducing colony stress and increasing honey production.
* This innovation supports sustainable agriculture and addresses global concerns about declining bee populations.

**MiniDoctor - The Pocket Therapist 2020**

* Built a health personalization app using NLP, Python, GCP Dialogflow, and MongoDB for real-time symptom analysis and health recommendations.
* Increased healthcare accessibility by providing personalized, data-driven health advice for users who may not have immediate access to medical professionals, helping to reduce the burden on healthcare systems and enabling early diagnosis.

**WeCare - Disaster Management and Preparedness 2020**

* Designed a disaster management app using Flutter and Firebase for real-time alerts and action plans.
* Improved preparedness and response times for natural disasters by providing communities with real-time alerts and disaster action plans, helping to save lives and minimize property damage.

**Hand-Motion Video Controller 2019**

* Developed a hand-motion-based video controller using Arduino and Python, employing image processing and motion detection algorithms.
* Offered a hands-free control solution for video playback, enhancing accessibility for users with physical disabilities and improving interaction with multimedia devices.

**Knee-Synovial Classification 2022**

* Created ML pipelines using Python and Pytorch to classify sonar images for knee synovial research.
* Enhanced the accuracy of early diagnostics for knee synovial conditions by improving image classification models, offering healthcare providers a more reliable tool for detecting joint diseases.

**Xorb AI (Mobile App, Machine Learning) 2021**

* Developed a mobile app using Flutter and TensorFlow for computational nutrition, recommending personalized calorie and exercise plans based on user health metrics.
* Helped users make informed decisions about their diet and exercise by providing personalized health recommendations, addressing the global need for accessible, AI-driven health solutions.

**Language Model Architecture for Research Platform 2023**

*Qualz-RA*

* Engineered a research platform using GPT-based language models, LangChain, and Hugging Face to optimize document search and classification.
* Provided researchers with a scalable tool for managing and retrieving information from large volumes of unstructured data, improving research efficiency and knowledge management.

**Big Data Analytics Pipeline for Telecom 2022**

*Ncell*

* Developed ETL pipelines using Apache Airflow and SQL for processing billions of telecom data points, improving customer churn prediction accuracy by 16%.
* Enabled telecom companies to identify at-risk customers and reduce customer churn, improving customer retention and revenue through data-driven insights.

**Medical Imaging with Computer Vision 2022**

*Wiseyak Inc.*

* Implemented CNN-based computer vision algorithms using TensorFlow and Keras for classifying medical images, improving diagnostic accuracy by 14%.
* Accelerated and improved the accuracy of medical diagnostics, offering healthcare professionals better tools for detecting diseases from medical images, leading to quicker treatments and better patient outcomes.

**AI/ML War Room for Use-Case Implementation 2022**

*Zummit Infolab*

* Led AI/ML war room sessions for refining real-time vision and depth measurement models using Python and PCL, reducing sensor calibration errors by 10%.
* Improved the accuracy of vision-based measurement systems, enabling better automation in robotics and 3D modeling, addressing key challenges in precision engineering and autonomous systems.

**SKILLS SUMMARY**

* **Languages**: Python, C++, R, JavaScript, SQL(Hive/Impala), Bash, JAVA, Tableau
* **Frameworks**: Scikit, Pytorch, TensorFlow, Keras, Flask, NodeJS, Flutter, MlOps (Kedro, MlFlow), Gradio
* **Tools**: Heroku, Docker, GIT, PostgreSQL, MySQL, SQLite
* **Platforms**: Linux, Web, Windows, Arduino, GCP, Azure Cloud
* **Soft Skills**: Event Management, Writing, Time Management
* **Data Governance & Management**: Data governance, Data profiling, Data catalog systems, Data mapping, Metadata management

**PUBLICATIONS**

* NASA Kentucky EPSCOR proposal titled: "Investigation of Material Surface Erosion and Failure due to High-Velocity Particle Impact.". Work in Progress.
* 3D Thermographic Analysis of Temperature Variations in Bee Hives: Insights into Cluster Dynamics and Bee Health". Poster Presented
* Personalized AI for Fitness. Proposal for developing AI fitness assistant.
* Binary Classification of Sonar Images. Proposal using Pytorch and label-studio.

**HONORS AND AWARDS**

* Outstanding mentoring to the SAP-24 from NSF - 2024
* First Honors Award - 2021
* Winner of Quantum Hack - 2020
* Winner of Autumn AI competition - 2020
* Endorsement Award Letter from Wolfram - 2020
* Selection in Hack20 Flutter- 2020

**VOLUNTEER EXPERIENCE**

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| --- | --- |
| **Community Research Member** | **Jan 2022 - Jan 2024** |
| * Formed an online research group called "Research Fellow" | |
| **NSF SAP-2024 Facilitator and Volunteer** | **Jun 2024 - Jul 2024** |
| * Guided high school students in STEM activities during on-site sessions | |
| **KCV Innovation Fellowship** | **Oct 2024 - Nov 2024** |
| * Completed the entrepreneur program course in market attack analyais for launching MVP product" | |