Ayush Manish Agrawal

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EDUCATION

University of Nebraska-Lincoln   **Lincoln, NE**
Bachelor of Science in Computer Science   May 2019
Minors: Mathematics, Business Administration

PROFESSIONAL EXPERIENCE

Research Engineer (Project Lead) – Volunteer   **Remote**
Manifold Computing   September 2020 – Current
- Solve several problems related to interpretable deep learning with a focus to understand the mechanisms behind learning systems
- Developed Relative Weight Change (RWC) metric to interpret layer-wise learning in a deep neural network during training to understand how architectural choice affects the model
- Utilized Google Cloud Platform (GCP) and monitored custom virtual machine instances for large scale computer vision and interpretability experiments

Software Developer   **Lincoln, NE**
University of Nebraska Central Administration (NeSIS)   April 2020 – Current
- Design and develop software using Spring Framework and ReactJS for all student applications allowing for improved scalability and faster development cycle for new features
- Built a full-stack issue submitting application written in .NET Core and ReactJS making the issue assignment process in the university a more seamless experience
- Created a library in Python to automate project versioning, thereby optimizing our teams' DevOps Lifecycle by reducing developer effort and eliminating version conflicts

Research Engineer – Volunteer   **Remote**
OpenMined   July 2020 – December 2020
- Worked on different problems to understand the complexity of systems under the lens of Data Privacy
- Reproduced several Federated Learning (FL) algorithms using PyTorch under different system parameters to understand the complexity of these algorithms
- Published a proposal to discuss a novel metric to determine complexity of an FL system, and got invited for a contributed talk in the workshop

Research Engineer – Volunteer   **Lincoln, NE**
Network-Centric and data-driven learning group   February 2020 – February 2021
- Developed a system to improve classification in camera-trap datasets such as Serengeti Snapshot that will allow in better understanding of different species, poacher activities in the national park
- Reduced noise and bias from the large-scale Serengeti Dataset ~3.4 million images using various data preprocessing techniques
- Explored supervised pre-training by creating a subset of the dataset for pretraining and then transferring learned weights for the remaining images to improve the generalization over the classes.

SAP Programmer/Analyst   **Lincoln, NE**
University of Nebraska Central Administration (NeBIS)   August 2019 – April 2020
- Implemented a recurring job for grants to send reminder emails allowing for a 75% increase in users meeting the deadline in approval of grants
- Designed 5+ new layouts utilizing SAP, JavaScript, HTML5, CSS3 to build applications providing a better user interface for the platform
- Tested over 30+ applications to identify bugs on different platforms and wrote 10+ documentation files to assist other developers for future enhancements and bugs

Software Engineer Intern   **Lincoln, NE**
FanWord   January 2018 – August 2018
- Improved FanWord's app built in Xamarin by fixing bugs, adding new features and UI enhancements leading to a 25% increase in user signups for the platform
- Modified the SDLC (Software Development Life Cycle) to follow Agile methodology, thus allowing the team to efficiently adapt to new feature requests and modifications
- Formulated a feature to scrape and automate the news feed in the mobile app, leading to faster news updates and eventually saving the company an estimated amount of $100,000 annually

Software Engineer - Associate   **Lincoln, NE**
Buckle (Raikes School of Computer Science and Management)   August 2017 – May 2018
- Developed an algorithm to automate inventory redistribution system leading to 70% faster redistribution of inventory within Buckle stores around the nation
- Implemented a modern web platform using Spring Framework and VueJS for the analyst team at Buckle to help them better control the inventory vs their system built in AS400
- Customized 10+ UI components in VueJS and preserved the functionality of the AS400 system, thus reducing the learning curve of the new platform for the analysts

TECHNICAL SKILLS
Languages: Python, Java, JavaScript, C#, SQL, MySQL, HTML, CSS, PeopleSoft
Frameworks: PyTorch, PyTorch-Lightning, Spring Framework, .NET Framework, ReactJS
Developer Tools: Git, Bash, Google Cloud Platform, VSCode, Jupyter, IntelliJ, Docker
Libraries: NumPy, Matplotlib, Pandas, Scikit-Learn, OpenCV, Mockito
Operating Systems: MacOS, Linux, Windows

PUBLICATIONS
- Ayush Manish Agrawal, Atharva A. Tendle, Harshvardhan D. Sikka, Sahib Singh, Amr Kayid. Investigating Learning in Deep Neural Networks using Layer-Wise Weight Change. Computing Conference 2021.
- Ayush Manish Agrawal, Atharva A. Tendle, Harshvardhan D. Sikka, Sahib Singh, Amr Kayid. "Investigating Learning in Deep Neural Networks using Layer-Wise Weight Change." In Advances in Neural Information Processing Systems (NIPS) NewInML Workshop 2020.
- Mulay, Ajinkya, Ayush Manish Agrawal, and Tushar Semwal. "FedPerf: A Practitioners' Guide to Performance of Federated Learning Algorithms." In Advances inNeural Information Processing Systems (NIPS) Pre-register Workshop 2020.