Matthew Byrd

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Education

Chapel Hill, NC **University of North Carolina at Chapel Hill** **Fall 2018 – Fall 2021**

- M.S. in Computer Science December 2022.
- B.S. in Computer Science & Mathematics December 2021. GPA: 3.6

Publications

[1] Matthew Byrd and Shashank Srivastava. "Predicting Difficulty and Discrimination of Natural Language Questions". In: *Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers)*. Dublin, Ireland: Association for Computational Linguistics, May 2022, pp. 119–130. doi: 10.18653/v1/2022.acl-short.15. url: https://aclanthology.org/2022.acl-short.15.

[2] Matthew A Byrd and Tyson Hedrick. "2D and 3D video digitizing with a web browser". In: *Society for Integrative and Comparative Biology 2021 Virtual Annual Meeting (VAM)* (2021). url: https://sicb.org/abstracts/2d-and-3d-video-digitizing-with-a-web-browser/.

Experience

Web Developer, Lead **Caktus Group** **Jan. 2022**

- Technical lead (3-person team) on a SAAS integration contract for a Django based security application.
- Responsible for 9 modules consisting of querying API data, storing it, and testing each aspect rigorously.
- Personally built 4 modules, each module adding value to our client's platform. Assisted in remaining modules.

Technologies: Python, Django, Docker, AWS, REST API, Git

Research Assistant **University of North Carolina at Chapel Hill** **May 2020**

- First author on a paper [1] published and selected for oral presentation in top NLP conference *ACL*.
- Developed a way to quantify and predict the difficulty of questions; useful for question answering research.
- As part of research, trained multiple SOTA question answering models distributed across 4 GPUs.
- Developed a rigorously tested pipeline for classifying medical data, to be utilized in UNC hospitals.

Technologies: Python, Torch, Sklearn, Transformers, Spacy, NLTK, Natural Language Processing, BERT

Research Programmer **University of North Carolina at Chapel Hill** **Aug. 2019 – Dec. 2021**

- Integrated pre-trained computer vision models to assist in automated video analysis using tensorflow.js.
- Sole author of web-based video analysis tools now used by UNC lab in biological research.
- Published technical contribution to biology community [2].

Technologies: Python, Django, Javascript, Computer Vision, Tensorflow, Tensorflowjs, HTML, CSS, Git

Accessible Web Developer **University of North Carolina at Chapel Hill** **Aug. 2018 – May 2019**

- Developed an automated video editor using Python, OpenCV, and NodeJS, which allowed for the automatic creation of accessible video games.
- Used C++ to create multi-threaded Python bindings, deceasing processing time by 50%.

Projects

- **Kaggle** (2022–Present). Built large language model classifiers to determine quality of student essays.
- **Liber** (2020). Mobile app used to catalog large personal libraries. Queries OpenBooks API to suport barcode scanning. Built with Flutter, Django.
- **NARC** (2018-2019). Machine learning based academic fraud detection system with 90+ downloads.

Additional Experience and Awards

- **Second Place, Hack Duke:** Awarded 2nd place for a novel learning management system concept, out of 32 projects.
- **ESL Volunteer:** Read with ESL children to help increase childhood literacy in local area - recognized by county board for contribution.