Frames White

Curriculum Vitae

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EDA and Compiler Engineer at JuliaHub (2023 Feb – 2024 July)

I worked on the CedarEDA electronic simulation tool, where I focused on compiler transformations for solving differential algebraic equations. A particularly important subset of this work was automatic differentiation, facilitating end-to-end differentiation of the simulation allowing, for example, differentiation of the rise-time with regards to the transistor width allowing automated tuning. More broadly, I delved deep into the Julia compiler internals which were heavily reused in this tool, including inference, constant propagation and abstract interpretation.

Research Software Engineer at Invenia Labs (2018 Oct – 2023 Feb)

I was a founding member of research software engineering team, which existed to handle tasks to technical for researchers and too scientific for developers. Here I developed practical expertise in design, machine learning, constrained and unconstrained optimisation, and automatic differentiation. As team grew, I took on a management role (both people management and project management), while still maintaining significant technical contributions and up-skilling many junior developers. From July 2022 on wards I was also the acting program manager, and eventually took on several other tasks from senior management.

Full History

2023 Feb – 2024 July	**EDA and Compiler Engineer**, *JuliaHub*, Remote
2021 July – 2023 Feb	**Research Software Engineering Group Lead**, *Invenia Labs*, Cambridge, UK
2018 Oct – July 2021	**Research Software Engineer**, *Invenia Labs*, Cambridge, UK
2015 March– 2018 Oct	**PhD (NLP/ML)**, *The University of Western Australia* Thesis: "On the surprising capacity of linear combinations of embeddings for natural language processing". (Machine learning for natural language processing)
2014 Nov – 2018 Oct	**Research and Teaching Assistant**, *The University of Western Australia*, Perth, Australia, (Casual)
2011 July – 2012 March	**Agile Platforms Developer**, *Bankwest*, Perth, Australia, Australian Computing Society Workplace Integrated Learning Scholarship
2009–2014	**Bachelor of Engineering, with Honours**, *The University of Western Australia* (Major in Electrical and Electronic Engineering)
2009–2014	**Bachelor of Computer and Mathematical Sciences**, *The University of Western Australia* (Double major in Pure Mathematics, and Computation)

Awards

2022 Julia Community Prize	Quote "For her many technical and community contributions across the Julia ecosystem."
2021 Best Poster Award	AbstractDifferentiation.jl: Backend-Agnostic Differentiable Programming in Julia, Frank Schäfer et al. (NeurIPS Differentiable Programming Workshop)
2020 DSTG Best Contribution to Science Award	WEmbSim: A Simple yet Effective Metric for Image Captioning, Naeha Sharif et al. (International Conference on Digital Image Computing: Techniques and Applications)
2016 Best Student Paper Award	Generating Bags of Words from the Sums of their Word Embeddings, White et al (Conference on Intelligent Text Processing and Computational Linguistics)

Organisations

2016 April – 2019 April	**Administrator of the Board**, *Western Australian Science Fiction Foundation*
2015 March – ∞	**Honarary Life Member**, *Unigames*, (UWA Student Society)

Open Source

I am the a major contributor to vastly too many projects to list here, both professionally and in my own time. A complete list is available at `https://github.com/oxinabox`, and you can find various talks on some of my projects by searching YouTube for "Frames White JuliaCon". Some of the more notable include: numerous contributions across the JuliaLang automatic differentiation ecosystem, including being the leader of the *ChainRules.jl* project. Other more notable packages I maintain include *LoggingExtras.jl*, *DataStructures.jl*, *DataDeps.jl*, *TestEnv.jl*, and *ProjectManagement.jl*. Previously I was also the comaintainer of *TensorFlow.jl* (now deprecated). There are functionally no large JuliaLang projects that do not include a package of mine as at least as an indirect dependency, and in most cases a direct dependency.

Publications

Note: I used **Lyndon White** as a pen-name up until February 2022. It thus appears as such in this section. I no longer use that name anywhere else.

[1] Lyndon White, Lyndon While, Ben Deeks, and Farid Boussaid. Transistor sizing using particle swarm optimisation. In *IEEE Symposium Series on Computational Intelligence*, pages 259–266, Dec 2015.

[2] Lyndon White, Roberto Togneri, Wei Liu, and Mohammed Bennamoun. How well sentence embeddings capture meaning. In *Proceedings of the 20th Australasian Document Computing Symposium*, ADCS '15, pages 9:1–9:8. ACM, 2015.

[3] Lyndon White, Roberto Togneri, Wei Liu, and Mohammed Bennamoun. Generating bags of words from the sums of their word embeddings. In *17th International Conference on Intelligent Text Processing and Computational Linguistics (CICLing)*, 2016. Best Student Paper Award.

[4] Lyndon White, Roberto Togneri, Wei Liu, and Mohammed Bennamoun. Modelling sentence generation from sum of word embedding vectors as a mixed integer programming problem. In *IEEE International Conference on Data Mining: High Dimensional Data Mining Workshop (ICDM: HDM)*, 2016.

[5] Lyndon White, Roberto Togneri, Wei Liu, and Mohammed Bennamoun. Finding word sense embeddings of known meaning. *19th International Conference on Intelligent Text Processing and Computational Linguistics (CICLing)*, 2018.

[6] Naeha Sharif, Lyndon White, , Mohammed Bennamoun, and Syed Afaq Ali Shah. Learning-based composite metrics for improved caption evaluation. In *Proceedings of the ACL Student Research Workshop*. Association for Computational Linguistics, 2018.

[7] Lyndon White, Roberto Togneri, Wei Liu, and Mohammed Bennamoun. Novelperspective: Identifying point of view characters. In *Proceedings of ACL 2018, System Demonstrations*. Association for Computational Linguistics, 2018.

[8] Lyndon White, Roberto Togneri, Wei Liu, and Mohammed Bennamoun. *Neural Representations of Natural Language*. Studies in Computational Intelligence (Book). Springer Singapore, 2018.

[9] Naeha Sharif, Lyndon White, Mohammed Bennamoun, and Syed Afaq Ali Shah. Nneval: Neural network based evaluation metric. In *Proceedings of the 15th European Conference on Computer Vision*. Springer Lecture Notes in Computer Science, 2018.

[10] Jonathan Malmaud and Lyndon White. Tensorflow. jl: An idiomatic julia front end for tensorflow. *Journal of Open Source Software*, 3(31):1002, 2018.

[11] Lyndon White. *On the surprising capacity of linear combinations of embeddings for natural language processing*. PhD thesis, The University of Western Australia, 2019.

[12] Naeha Sharif, Lyndon White, Mohammed Bennamoun, Wei Liu, and Syed Afaq Ali Shah. Lceval: Learned composite metric for caption evaluation. *International Journal of Computer Vision*, 127(10):1586–1610, October 2019.

[13] Mahdi Jamei, Letif Mones, Alex Robson, Lyndon White, James Requeima, and Cozmin Ududec. Meta-optimization of optimal power flow. In *ICML Workshop, Climate Change: How Can AI Help*, 2019.

[14] Ayush Kaushal, Lyndon White, Mike Innes, and Rohit Kumar. Wordtokenizers.jl: Basic tools for tokenizing natural language in julia. *Journal of Open Source Software*, 5(46):1956, 2020.

[15] Naeha Sharif, Lyndon White, Mohammed Bennamoun, Wei Liu, and Syed Afaq Ali Shah. Wembsim: A simple yet effective metric for image captioning. In *Digital Image Computing: Techniques and Applications, 2020 (DICTA 2020)*, United States, November 2020. IEEE, Institute of Electrical and Electronics Engineers. DSTG Best Contribution to Science Award.

[16] Frank Schäfer, Mohamed Tarek, Lyndon White, and Chris Rackauckas. Abstractdifferentiation.jl: Backend-agnostic differentiable programming in julia. In *NeurIPS Differentiable Programming Workshop*, 2021. Best Poster Award.