

# 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 onwards I was also the acting program manager, and eventually took on several other tasks from senior management.

### Full History

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

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## Awards

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| 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)              |

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## Organisations

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| 2016 April – 2019 April | <b>Administrator of the Board</b> , <i>Western Australian Science Fiction Foundation</i> |
| 2015 March – ∞          | <b>Honorary Life Member</b> , <i>Unigames</i> , (UWA Student Society)                    |

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## Open Source

I am 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 previously used **Lyndon White** as a pen-name. It thus appears as such in this section. I no longer use that name.

- [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.