

# Evan Lezar

CV

✉ [mail@evanlezar.com](mailto:mail@evanlezar.com)  
[www.evanlezar.com](http://www.evanlezar.com)

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## Education

- 2011 **PhD (electronic engineering)**, *Stellenbosch University*.  
**thesis title:** GPU Acceleration of Matrix-based Methods in Computational Electromagnetics  
**supervisor:** Prof. D.B. Davidson  
**development languages:** Python, C, C++
- 2008 **MScEng (electronic engineering) (*cum laude*)**, *Stellenbosch University*.  
**thesis title:** *hp*-Adaptation for the FEM Analysis of Waveguides  
**supervisor:** Prof. D.B. Davidson  
**development languages:** Matlab, Python
- 2005 **BEng (electronic engineering) (*cum laude*)**, *Stellenbosch University*.  
**final year project title:** Investigation of Score-Based Information Fusion Methods Applied to Speaker Verification  
**supervisor:** Prof. J.A. du Preez  
**subjects include:** digital and analogue design, signal processing, computer vision, pattern recognition, control systems
- 2003 **BSc (physics and computer science) (*cum laude*)**, *Stellenbosch University*.  
**subjects include:** physics, computer science, mathematics, applied mathematics

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## Experience

### Commercial

- 2015–present **Data Scientist**, *Zalando SE*, Berlin, Germany.  
I am part of the Statistical Learning team at Zalando SE. Here, I add GPU computing expertise to a team that investigates state of the art machine learning solutions to problems and challenges faced by Europe's number one fashion e-tailer.
- 2011–2015 **Senior developer – electromagnetic solutions**, *Altair Engineering*, Böblingen, Germany.  
**Solver developer**, *EMSS-GmbH (prior to merger with Altair Engineering)*, Böblingen, Germany.  
I was part of the development team for the FEKO computational electromagnetic solver. This included the integration of new solution technologies, the investigation of the GPU acceleration, and general maintenance. Our primary development languages were Fortran and C, but I also used C++ and Python.
- 2009–2011 **Research contractor (part-time)**, *EMSS-SA*, Stellenbosch, South Africa.  
I investigated various extensions to the computational electromagnetic simulation package FEKO. These included iterative eigensolvers as well as options for the GPU acceleration of the Method of Moments (Boundary Element Method) using CUDA.
- 2008 **Developer (part-time)**, *EMSS-Consulting*, Stellenbosch, South Africa.  
I carried out an investigation of GPU acceleration and the optimisation of algorithms used in the IXUS software package. Development was done in C++ and Matlab.

2000–2005 **Developer (part-time)**, *Made to Measure Computer Systems*, Hoekwil, South Africa.  
I was responsible for all aspects of the design and development of a medical accounting software package. This included the user interface, as well as databases and the backend. The development was done using Delphi under Windows.

#### Academic

2011 **Postdoctoral research fellow**, *Department of Electrical and Electronic Engineering, Stellenbosch University*, Stellenbosch, South Africa.

I was part of a group working on a Python-based finite element code (using the open source FEniCS Project) for solving electromagnetic problems.

2009 **Project advisor**, *Department of Electrical and Electronic Engineering, Stellenbosch University*, Stellenbosch, South Africa.

I proposed and supervised a research project for a final year engineering (BEng) student.

2008 **Teaching assistant**, *Department of Electrical and Electronic Engineering, Stellenbosch University*, Stellenbosch, South Africa.

My responsibilities included the marking of tests and assisting with practicals for a final year engineering course on wireless system design.

2006–2007 **Junior lecturer**, *Department of Mathematical Sciences, Stellenbosch University*, Stellenbosch, South Africa.

My main role was the teaching of a course on computer architecture and x86 assembler programming for second year students. This included the setting up and marking of theory and practical examinations as well as a semester project.

I also taught a one week introductory course for prospective first year computer science students. The lectures covered topics including computer architecture and algorithmic design. The course also included practicals on the basics of programming using C.

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### Project experience

2008 **Google Summer of Code participant**, *K-3D*, [www.k-3d.org](http://www.k-3d.org).

I investigated the use of NVIDIA CUDA to accelerate various K-3D plugins while working as a member of the development team for this open source project. Development was done in C/C++ and Python.

2003 **COMAP Mathematical Contest in Modelling**, *Department of Applied Mathematics, Stellenbosch University*, Stellenbosch, South Africa.

I was part of a three person team that participated in a contest to solve a predefined problem using mathematical modelling techniques. Our team received an honourable mention.

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### Skills

#### Programming languages

frequent use Fortran, C, C++, Python

also use Assembler (x86), Bash, Delphi, Go, Java, Matlab, Oberon, Pascal

#### Other

OS Linux, Windows

tools  $\LaTeX$ , HTML, GNU make

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### Languages

English Fluent

*spoken and written*

Afrikaans Fluent

*spoken and written*

German Intermediate

Japanese Elementary

*passed Japanese Language Proficiency Test (N4)*

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## Publications

- E. Lezar and U. Jakobus. GPU-acceleration of the FEKO electromagnetic solution kernel. In *Electromagnetics in Advanced Applications (ICEAA), 2013 International Conference on*, pages 814–817, 2013.
- E. Lezar and D.B Davidson. Electromagnetic waveguide analysis. In Anders Logg, Kent-Andre Mardal, and Garth N. Wells, editors, *Automated Solution of Differential Equations by the Finite Element Method, Volume 84 of Lecture Notes in Computational Science and Engineering*, pages 629–642. Springer, 2012.
- E. Lezar and D.B. Davidson. GPU acceleration of electromagnetic scattering analysis using the method of moments. In *Electromagnetics in Advanced Applications (ICEAA), 2011 International Conference on*, pages 452–455, 2011.
- E. Lezar. *GPU Acceleration of Matrix-based Methods in Computational Electromagnetics*. PhD thesis, Stellenbosch University, March 2011.
- E. Lezar and D.B. Davidson. GPU acceleration of method of moments matrix assembly using Rao-Wilton-Glisson basis functions. In *Electronics and Information Engineering (ICEIE), 2010 International Conference On*, volume 1, pages V1–56–V1–60, 2010.
- E. Lezar and D.B. Davidson. GPU-based LU decomposition for large method of moments problems. *Electronics Letters*, 46(17):1194–1196, 2010.
- E. Lezar and D.B. Davidson. GPU-accelerated method of moments by example: Monostatic scattering. *Antennas and Propagation Magazine, IEEE*, 52(6):120–135, 2010.
- E. Lezar and D.B. Davidson. GPU-based Arnoldi factorisation for accelerating finite element eigenanalysis. In *Electromagnetics in Advanced Applications, 2009. ICEAA '09. International Conference on*, pages 380–383, 2009.
- E. Lezar. *hp-Adaptation for the FEM Analysis of Waveguides*. Master’s thesis, Stellenbosch University, March 2008.
- E. Lezar and D.B. Davidson. Implementation of arbitrarily high order hierarchical vector basis functions for the finite element analysis of a rectangular waveguide. In *8th IEEE AFRICON Conference*, 2007.