
CURRICULUM VITAE

ALEXANDRE HARDY

Personal Details

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Spoken Languages: English
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Academic Qualifications

Date	Qualification	Institution
September 2005	PhD. (Applied Mathematics) Thesis title: <i>Harmonic Interpolation for Smooth Curves and Surfaces</i>	University of Johannesburg
March 2000	M.Sc. (Computer Science) Cum Laude Dissertation title: <i>An Implementation and Analysis of the Configurable Security Architecture</i>	R.A.U.
March 1999	B.Sc Hons. (Computer Science) Cum Laude	R.A.U.
July 1998	Fuzzy Logic Certificate Course	R.A.U. (ISSC)
March 1998	B.Sc (Computer Science and Informatics) Cum Laude	R.A.U.
December 1994	Matric Exemption	Krugersdorp High

Work Experience – Positions

Date	Institution	Position
2019–	Vula Mobile	Backend and Android developer
2013–2019	Oracle, California	Consulting Member of Technical Staff
2009–2013	Nimbula Software Development	Software Engineer
2008–2009	University of Johannesburg	Associate Professor
2005–2007	University of Johannesburg	Senior Lecturer
2003–2006	UNISA	Remarker (Operating Systems)
2004	University of Pretoria	External Examiner (COS324/COS226)
2003	University of Pretoria	External Examiner (COS324, RNW780)
2001–2004	R.A.U.	Lecturer
2000	R.A.U.	Junior Lecturer
1997–1999	R.A.U.	Assistant (Computer Science)
1996	R.A.U.	Assistant (Mathematics)

Work Experience – Vula Mobile

Vula Mobile is a company focussing on the health care sector, supporting health care workers with patient referrals. I managed to join Vula at a point in time where the development team was being formed (before that contractors were responsible for development). I have been responsible for:

- Increasing test coverage of the backend system
- Ensuring that test are a required part of the CICD pipeline for the backend
- Improvements to the CICD delivery phase for deployment to production
- Implementation of the handover feature to allow referral responsibility to be transferred to another team member, in the backend
- Analysis of the database structure, with recommendations for performance improvements
- Development of the Android implementation of handover
- Completion of the final phases of Referral by Hospital for Android

During my time at Vula I have tried to be involved in many aspects, and have slowly migrated to an Android development role. I plan to improve the code base to reduce the risk of errors, and to increase the test coverage on the Android code base.

Work Experience – Oracle

At Oracle I have been primarily involved with the development of Nimbula Director, focusing on integration with Oracle. I have played a lead role in the design and implementation of the following components:

- Database query engine for NoSQL.
- Python libraries for interacting with NoSQL.
- Query and database libraries for python.
- Database backup and restore.
- Tracking of an API request through multiple services.
- Optimisation of DNS record propagation.
- Collection of metrics for DNS propagation speed.
- Protoyping semi-live migration of disk volumes.

Work Experience – Oracle (*continued*)

- VNC for virtual machines in the Oracle Cloud.
- Screen capture for virtual machines in the Oracle Cloud.
- Conversion of the control plane to Kubernetes infrastructure.

In addition to these activities I am involved in many design sessions for integrating the control plane with ExaLogic, and integration of Nimbula Director with other software products. I assist in debugging, fixing and diagnosing errors on a regular basis and provide guidance on many implementation details to team members. I have extensive knowledge about most of the product.

Work Experience – Nimbula

I have been actively involved in the development of Nimbula Director, the cloud operating system. Various features I have worked on include:

- Federation of identity across clouds.
- DNS as a service.
- Database integration.
- Database query engine.
- Linux installer based development.

I have been involved in various phases of the development lifecycle with this product, including design, implementation and testing.

Nimbula was acquired by Oracle in 2013.

Work Experience – Subjects Presented

Date	Subject	Level
2002–2008	Computer Graphics	Postgraduate
2004–2006,2008–2009	Compiler Construction	Postgraduate
2001, 2003–2005	Systems Programming (Linux Driver Development)	Postgraduate
2000	Concurrency	Postgraduate
2000–2003	Introduction to Functional Programming	Postgraduate
2002–2009	Introduction to Algorithm Development(C++)	Undergraduate
2002–2006	Introduction to Data Structures(C++)	Undergraduate

Work Experience – Extracurricular

Date	Subject	Level
2002–2006	Module 1 - Introduction to programming	ITDiploma
2002–2006	Module 2 - Datastructures	ITDiploma
2002–2005	Module 7 - Data communications and networks	ITDiploma
2002–2008	Module 10 - Operating systems	ITDiploma

Academic Awards

Date	Award	Institution
1998	Student Council Academic Colours	R.A.U.
	ABSA Scientia Award	R.A.U.
1997	Liberty Life Award: Computer Science 3	R.A.U.
	Liberty Life Award: Informatics 3	R.A.U.
	Top Achiever: Faculty of Science	R.A.U.
1996	Liberty Life Award: Informatics 2	R.A.U.
1994	Academic Colours	Krugersdorp High School

International Collaboration

Fraunhofer Institute, Berlin, 2003. Collaboration on timetabling systems and e-Learning environments.

Fraunhofer Institute, Berlin, 2005. Development of a web based time tabling system based on CONBATT.

Conference Committees

Reviewer, Transactions on Computational Intelligence and AI in Games, December 2010

AFRIGRAPH 2009 Conference chair

6th International Conference on Virtual Reality, Computer Graphics,
Visualisation and Interaction in Africa 4–6 February 2009, Pretoria, South Africa

AFRIGRAPH 2009 Programme committee

6th International Conference on Virtual Reality, Computer Graphics,
Visualisation and Interaction in Africa 4–6 February 2009, Pretoria, South Africa

AFRIGRAPH 2007 Programme committee

5th International Conference on Virtual Reality, Computer Graphics,
Visualisation and Interaction in Africa 29–31 October 2007, Grahamstown, South Africa

Skills

Operating systems:

- Microsoft Windows
- Linux
- MacOSX

Programming Languages:

- Microsoft Visual Basic
- Java and MIDP
- C++
- PHP, Perl, Python
- Standard ML
- Scheme

Programming Paradigms:

- GPU Programming
- Parallel programming (MPI)
- Functional programming

Publications

A. Hardy, H. Venter. 3-View Impostors. Proceedings of Afrigraph 2010, 129–138, 2010.

A. Hardy. Programmable Transitions for Video Stream Editing. Proceedings of Afrigraph 2009, 101–107, 2009.

A. Hardy, W.-H. Steeb. *Mathematical Tools in Computer Graphics with C# Implementations*. World Scientific, 2008.

A. Hardy. Interpolatory $\sqrt{3}$ Subdivision with Harmonic Interpolation. Proceedings of Afrigraph 2007, 95–100, 2007.

H. Venter, A. Hardy. Generating Plants with Gene Expression Programming. Proceedings of Afrigraph 2007, 159–167, 2007.

Publications (*continued*)

N. Zink, A. Hardy. Cloth Simulation and Collision Detection Using Geometry Images. Proceedings of Afrigraph 2007, 187–195, 2007.

D.A.K. Mc Roberts, A. Hardy. Level of Detail for Terrain Geometry Images. Proceedings of Afrigraph 2007, 25–30, 2007.

J. K. Loots, A. Hardy. Parallel Communication for Animating Fluids. Poster. Afrigraph 2007.

A. Hardy, D.A.K. Mc Roberts. Blend Maps: Enhanced Terrain Texturing. Proceedings of SAICSIT 2006, 61–70, 2006.

A. Hardy, W.-H. Steeb. Harmonic Interpolation for Image Compression. International Journal of Image and Graphics **6** (4): 657–676, World Scientific, 2006.

A. Hardy, W.-H. Steeb. A Note on Schuster’s Lagrange Interpolation Method. International Journal of Shape Modeling **12** (1): 75–86, World Scientific, 2006

W.-H. Steeb, Y. Hardy, A. Hardy, R. Stoop. *Problems & Solutions in Scientific Computing, with C++ and Java Simulations*, World Scientific, 2004

A. Hardy, W.-H. Steeb. Harmonic Interpolation and Lie Groups. International Journal of Theoretical Physics. **43** (5):1261–1266, 2004

A. Hardy, W.-H. Steeb. Harmonic Interpolation, Bézier Curves and Trigonometric Interpolation. Z. Naturforsch **59a**, pg. 591–596. 2004

A. Hardy, M.S. Olivier. A Comparison Between ConSA and Current Linux Security Implementations. In *Data and Applications Security XV*, pages 211–224. Kluwer Academic Publishers, 2002

A. Hardy, M.S. Olivier. A Configurable Security Architecture Prototype. In *Data and Applications Security, Developments and Directions*, pages 51–62. Kluwer Academic Publishers, 2001

Supervision – Completed

Duncan Andrew Keith Mc Roberts, Real-time Rendering of Synthetic Terrain, M.Sc, University of Johannesburg, 2011

Nico Zink, Cloth simulation and collision detection using geometry images, M.Sc, University of Johannesburg, 2011

Hannes Venter, Evolutionary Generation of Plant Models, M.Sc, University of Johannesburg, 2009

Tristan Didier Alexandre Dopler, (co-supervisor) Code Optimisation Using Discrete Optimisation Techniques, M.Sc, University of Johannesburg, 2006.

Ralf Globisch, Automated Grasping for Articulated Structures Using Evolutionary Learning Algorithms, M.Sc, University of Johannesburg, 2005.

Warren Hodgkinson, Interactive Speech-Driven Facial Animation, M.Sc, University of Johannesburg, 2005

Patents

- Naïve, lock-free, client-side sharding with online addition of shards, 2017
- Launching an instance in a virtual computing infrastructure, 2013
- Virtualization layer in a virtual computing infrastructure, 2012
- Billing usage in a virtual computing infrastructure, 2012
- Granting access to a cloud computing environment using names in a virtual computing infrastructure, 2012
- Organizing permission associated with a cloud customer in a virtual computing infrastructure, 2012
- Defining an authorizer in a virtual computing infrastructure, 2012
- Networking in a virtual computing infrastructure, 2012
- Objects in a virtual computing infrastructure, 2012
- Organizing data in a virtual computing infrastructure, 2012
- Building a cloud computing environment using a seed device in a virtual computing infrastructure, 2012