

# ELAN VAN BILJON

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## SUMMARY

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I am a hardworking, self-motivated and determined individual who is not satisfied until he understands exactly why and how things work. I am very interested in artificial intelligence and machine learning and spend most of my free time learning about new concepts in the field.

## SKILLS

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<b>Machine Learning and Reinforcement Learning</b>	Through my degree and much self-study, I have built up my knowledge of machine learning. I am particularly interested in reinforcement learning and my thesis covered one of the approaches known as Deep Q-learning.
<b>Algorithms and Data-Structures</b>	I have spent many a holiday and late night participating in, and practising for, online programming competitions. This has developed my knowledge of algorithms and data structures.
<b>Mathematical Problem Solving</b>	I have had a love for mathematics for as long as I can remember. This lead me to take extra-curriculars to develop my mathematical problem solving skills
<b>Signal and Data Processing</b>	Through my self-study and competition experience, I have learnt that properly processing data before it is used is perhaps more important than the model itself.
<b>Software and Web Development</b>	Throughout my degree and while working for Moz I picked up valuable software and web development skills such as how to collaborate on large projects, creating clean understandable and manageable code and using testing schemes to ensure code is always working correctly.
<b>Concept Communication</b>	While tutoring for the mathematics department and working at Moz I learnt the art of communicating one's ideas and abstract topics efficiently and clearly.

## TECHNOLOGY SUMMARY

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<b>Programming languages:</b>	Python, Octave, Java, C, C++, JavaScript, CoffeeScript, PHP.
<b>Libraries / development tools:</b>	TensorFlow, Keras, Numpy, Git.
<b>Programming competitions:</b>	Google Code Jam, Kaggle, HackerRank, CodinGame.
<b>Online Profiles:</b>	<a href="#">GitHub</a> , <a href="#">CodinGame</a> , <a href="#">Hacker Rank</a> , <a href="#">OpenCV</a> , <a href="#">LinkedIn</a> .

## EDUCATION

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<b>2017 – current</b>	University of Stellenbosch – <b>MSc Computer Science</b> Topic: Generality of Model-based Reinforcement Learning
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- 2014 – 2017** University of Stellenbosch – **BEng Electrical and Electronic Engineering**  
Research Project Topic: Creating Intelligent Agents with Reinforcement Learning  
GPA: 77% (Graduated Cum Laude)  
Received distinctions for 26 courses including the following: Computer Science – **machine learning, Object Oriented Programming**, Engineering Mathematics – **Differential and Integral Calculus, Linear Algebra and Differential Equations** (see appendix for more details).
- 2013** High School: Somerset College  
GPA: 84%  
4 distinctions: Information Technology (Java Object Oriented Programming), Science and both Mathematics subjects.  
Top of my class in Information Technology.  
Awarded Academic Honours twice for my consistently high academic results in all subjects.

## EXPERIENCE

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- Software Engineering Intern** June - August 2016  
Moz, Seattle, WA, USA  
**Front-end web developer**  
Main project: overhaul the product purchase flow on the website
- Mathematics Tutor** February - June 2016  
Stellenbosch University, South Africa  
**Aid students in understanding pure mathematics**  
Main responsibilities: Answering questions, explaining concepts and guiding students through mathematical problems
- Deep Learning Indaba** September 2017  
**Attended the 2017 Deep Learning Indaba**  
One of ten undergraduate students compared to over 300 academic and industry professionals who attended.
- Conference Organising** Current  
**Operations team: organising a Bayesian inference workshop**  
Speakers include: John Skilling, Kevin Knuth, Allen Caldwell and Udo von Toussaint  
I am also heading the team that is arranging the IndabaX (a one day machine learning conference that mimics the spirit of the Deep Learning Indaba) that will be hosted at the University of Stellenbosch in 2018.

## ACHIEVEMENTS

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<b>1<sup>st</sup> place in Kaggle competition</b>	I took part in my first Kaggle competition in 2017, the goal being to use individual level data to predict whether a client would default on their loan. My sister and I formed a team and we took 1 <sup>st</sup> place
<b>Deans Merit (2015, 2016, 2017)</b>	The Deans Merit Award is given to those that finish an academic year with an average GPA of 75% or above.
<b>Top Engineering Student in Cluster</b>	Upon entry to the university, each student is placed in one of four clusters. I was the top engineering student in my student cluster for my final year.
<b>Member of the Golden Key Society</b>	The Golden Key Society invites students who globally place in the top 15% in their respective fields to join the society.

## REFERENCES

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Dr. Steve Kroon	<a href="mailto:kroon@sun.ac.za">kroon@sun.ac.za</a>	+27 21 808 4232
Dr. Herman Kamper	<a href="mailto:kamperh@sun.ac.za">kamperh@sun.ac.za</a>	+27 21 808 4457
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## PERSONAL INFORMATION

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I was born in Pretoria, South Africa in the 15th of September 1995. I am a male currently live in Stellenbosch, South Africa. My Hobbies include memory training, hiking, slacklining, computer and strategy based board gaming. I also competed in multiple sports at university level, including hockey, underwater hockey, water polo and squash.

## COMMUNITY SERVICE

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| <ul style="list-style-type: none"><li>• Animal welfare work</li><li>• Community infrastructure improvement operations (putting up fences around houses in underprivileged communities, etc.)</li></ul> | <ul style="list-style-type: none"><li>• Student tutoring</li><li>• Teaching sports to underprivileged children</li><li>• Working with underprivileged children</li></ul> |
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## APPENDIX

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Subject	Content
<b>Machine Learning</b> (Computer Science 315)	Dimension reduction techniques; machine-learning techniques based on maximum-likelihood, maximum-posterior and expectation-maximization estimates; modelling using logistic regression, Gaussian mixtures and hidden Markov models.

**Object-Oriented  
Programming**

(Computer Science E-214)

Formulation and solution of problems by means of computer programming in an object-oriented set-up; principles of testing and debugging; key concepts in object orientation: abstraction, encapsulation, inheritance and polymorphism; design patterns as abstractions for the creation of reusable object oriented designs; searching and sorting algorithms; complexity theory for the analysis of algorithms; fundamental methods in the design of algorithms; dynamic data structures.

**Engineering  
Mathematics**

Introductory Differential and Integral Calculus, Further Differential and Integral Calculus, Differential Equations and Linear Algebra, Series and Partial Differential Equations:

Mathematical induction and the binomial theorem; functions; limits and continuity; derivatives and rules of differentiation; applications of differentiation; the definite and indefinite integral; integration of simple functions.

Complex numbers; transcendental functions; integration techniques; improper integrals; conic sections; polar coordinates; partial derivatives; introduction to matrices and determinants

Ordinary differential equations of first order; linear differential equations of higher orders; Laplace transforms and applications. Matrices: linear independence, rank, eigenvalues. Laplace transforms and applications.

Infinite series and Taylor series; Fourier series; introduction to partial differential equations; Fourier transforms.