

# Maria van der Walt | Curriculum Vitae

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## Education

### University of Missouri-St. Louis

*Doctor of Philosophy (Applied Mathematics)*

Title of thesis: "Wavelet analysis of non-stationary signals with applications"

Thesis advisor: C.K. Chui

St. Louis, MO

May 2015

### Stellenbosch University

*Master of Science (Mathematics), Cum Laude*

Title of thesis: "Ternary interpolatory subdivision"

Supervisor: J.M. de Villiers

Stellenbosch, South Africa

December 2012

### Stellenbosch University

*Bachelor of Science (Honors) (Mathematics), Cum Laude*

Stellenbosch, South Africa

December 2010

### Stellenbosch University

*Bachelor of Science (Mathematical Sciences), Cum Laude*

Majors: Mathematics, Applied Mathematics

Stellenbosch, South Africa

December 2009

## Employment history

### Vanderbilt University

*Assistant professor*

Courses taught:

- Introduction to Numerical Mathematics
- Methods of Linear Algebra
- Accelerated Single-Variable Calculus II
- Differential Equations and Linear Algebra

Nashville, TN

August 2015 – present

Spring 2017

Fall 2016, Spring 2017

Summer 2016

Spring 2016

### University of Missouri-St. Louis

*Graduate teaching assistant / Instructor*

Courses taught as instructor of record:

- Trigonometry
- Basic Probability and Statistics
- Intermediate Algebra
- Beginning Algebra

St. Louis, MO

January 2013 – May 2015

Spring 2014, Fall 2014, Spring 2015

Spring 2014

Fall 2013

Fall 2013

### Stellenbosch University

*Temporary lecturer*

Courses taught:

- Calculus I

Stellenbosch, South Africa

July 2012 – December 2012

### Stellenbosch University

*Tutorial coordinator*

Stellenbosch, South Africa

January 2012 – July 2012

Tutorial programs managed:

- Mathematics for the Biological Sciences

### **Stellenbosch University**

*Teaching assistant*

Courses tutored:

- Calculus I
- Mathematics for the Biological Sciences
- Introductory Mathematics
- Introductory Differential and Integral Calculus
- Further Differential and Integral Calculus
- Differential Equations and Linear Algebra
- Series, Partial Differential Equations and Fourier Transform
- Linear Programming
- Nonlinear Optimization

**Stellenbosch, South Africa**

*January 2009 – July 2012*

*2009,2011,2012*

*2009,2010,2011,2012*

*2010*

*2010,2011*

*2010,2011*

*2011,2012*

*2010,2011*

*2009*

*2009*

## **Research papers and publications**

- C.V. Beccari, M. Neamtu and M.D. van der Walt, "On the approximation order of rational geometric splines", in preparation.
- H.N. Mhaskar, S.V. Pereverzyev and M.D. van der Walt, "A deep learning approach to diabetic blood glucose prediction", submitted for publication.
- M.D. van der Walt, "Real-time, local spline interpolation schemes on bounded intervals", Applied Mathematical Sciences, 10(5): 205–234, 2016.
- C.K. Chui, H.N. Mhaskar and M.D. van der Walt, "Data-driven atomic decomposition of real-world signals", International Journal on Geomathematics, 6(1):1–30, 2016.
- C.K. Chui and M.D. van der Walt, "Signal analysis via instantaneous frequency estimation of signal components", International Journal on Geomathematics, 6(1):1–42, 2015.

## **Conference, colloquium and seminar talks**

*Invited talks.....*

**Colloquium: Department of Mathematics, Westmont College**

**Santa Barbara, CA**

Title of talk: "Two of my favorite recent research projects"

*November 14, 2016*

**Mecklenburg Workshop on**

**Approximation Methods and Data Analysis**

**Hasenwinkel, Germany**

Title of talk: "Data-driven atomic decomposition via frequency extraction of intrinsic mode functions"

*September 5-9, 2016*

**Colloquium: Department of Mathematical and Statistical Sciences, University of Alberta**

**Edmonton, Canada**

Title of talk: "Signal analysis via instantaneous frequency estimation of signal components"

*February 3, 2015*

**Computational Analysis Seminar: Vanderbilt University**

**Nashville, TN**

Title of talk: "Signal analysis via instantaneous frequency estimation of signal components"

*November 12, 2014*

## Contributed talks.....

### **15<sup>th</sup> International Conference on Approximation Theory** **San Antonio, TX**

Title of talk: "Data-driven atomic decomposition via frequency extraction of intrinsic mode functions" **May 22-25, 2016**

### **Analysis Seminar: Saint Louis University** **St. Louis, MO**

Title of talk: "Signal analysis via instantaneous frequency estimation of signal components" **November 7, 2014**

### **55<sup>th</sup> Annual SAMS Congress** **Stellenbosch, South Africa**

Title of talk: "Ternary interpolatory subdivision" **October 31 - November 2, 2012**

### **Postgraduate Seminar: Department of Mathematical Sciences, Stellenbosch University** **Stellenbosch, South Africa**

Title of talk: "Ternary interpolatory subdivision" **May 11, 2012**

## Awards

### **University of Missouri-St. Louis** **St. Louis, MO**

Edward Z. Andalafte Memorial Scholarship **2015**

Graduate School Doctoral Recruitment Fellowship **2013,2014**

### **Stellenbosch University** **Stellenbosch, South Africa**

Stellenbosch University medal for the best master's student in the Faculty of Science **2012**

Harry Crossley bursary **2011,2012**

Dean's medal for the best achieving honors student in the Faculty of Science **2010**

Rector's award for excellent achievement (academic) for the best achieving honors student in the Faculty of Science **2010**

Bursary from Elaine Forsyth Memorial Trust **2008,2009,2010**

G.B.B. Rubbi book prize for best marks obtained in Mathematics **2007,2008,2009,2010**

Merit bursary **2007,2008,2009,2010**

### **Other** **South Africa**

6<sup>th</sup> highest final grade in the Western Cape province in the Senior Certificate Examinations **2006**

Highest marks in the Western Cape province in Mathematics and Music in the Senior Certificate Examinations **2006**

## Service

- Review Editor for *Mathematics of Computation and Data Science*,  
Frontiers in Applied Mathematics and Statistics **September 2016 – present**
- Referee for *Signal Processing* **2016**
- Referee for *Journal of Approximation Theory* **2015**
- Referee for *Applied and Computational Harmonic Analysis* **2015**

## References

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**Prof. Mike Neamtu**

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Dept. of Math. Chair, Vanderbilt University

**Prof. Charles K. Chui**

✉ ckchui@stanford.edu 📞 (650) 853-3034

PhD thesis advisor

**Prof. Johan de Villiers**

✉ jmdv@sun.ac.za 📞 (+2776) 053-5864

Master's degree supervisor

**Prof. Haiyan Cai**

✉ haiyan\_cai@umsl.edu 📞 (314) 516-6719

Dept. of Math. Chair, UMSL

**Prof. H.N. Mhaskar**

✉ hmhaska@caltech.edu 📞 (323) 343-2150

Collaborator