

# Maria van der Walt | Curriculum Vitae

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## Education

<b>University of Missouri-St. Louis</b> <i>Doctor of Philosophy (Applied Mathematics)</i> Title of thesis: "Wavelet analysis of non-stationary signals with applications" Thesis advisor: C.K. Chui	<b>St. Louis, MO</b> May 2015
<b>Stellenbosch University</b> <i>Master of Science (Mathematics), Cum Laude</i> Title of thesis: "Ternary interpolatory subdivision" Supervisor: J.M. de Villiers	<b>Stellenbosch, South Africa</b> December 2012
<b>Stellenbosch University</b> <i>Bachelor of Science (Honors) (Mathematics), Cum Laude</i>	<b>Stellenbosch, South Africa</b> December 2010
<b>Stellenbosch University</b> <i>Bachelor of Science (Mathematical Sciences), Cum Laude</i> Majors: Mathematics, Applied Mathematics	<b>Stellenbosch, South Africa</b> December 2009

## Employment history

<b>Vanderbilt University</b> <i>Assistant professor</i> Courses taught: <ul style="list-style-type: none"><li>○ Methods of Linear Algebra</li><li>○ Accelerated Single-Variable Calculus II</li><li>○ Differential Equations and Linear Algebra</li></ul>	<b>Nashville, TN</b> August 2015 – present Fall 2016 Summer 2016 Spring 2016
<b>University of Missouri-St. Louis</b> <i>Graduate teaching assistant / Instructor</i> Courses taught as instructor of record: <ul style="list-style-type: none"><li>○ Trigonometry</li><li>○ Basic Probability and Statistics</li><li>○ Intermediate Algebra</li><li>○ Beginning Algebra</li></ul>	<b>St. Louis, MO</b> January 2013 – May 2015 Spring 2014, Fall 2014, Spring 2015 Spring 2014 Fall 2013 Fall 2013
<b>Stellenbosch University</b> <i>Temporary lecturer</i> Courses taught: <ul style="list-style-type: none"><li>○ Calculus I</li></ul>	<b>Stellenbosch, South Africa</b> July 2012 – December 2012
<b>Stellenbosch University</b> <i>Tutorial coordinator</i>	<b>Stellenbosch, South Africa</b> January 2012 – July 2012

Tutorial programs managed:

- Mathematics for the Biological Sciences

### **Stellenbosch University**

*Teaching assistant*

Courses tutored:

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|--|---------------------|
| ○ Calculus I   | 2009,2011,2012      |
| ○ Mathematics for the Biological Sciences                      | 2009,2010,2011,2012 |
| ○ Introductory Mathematics                                     | 2010                |
| ○ Introductory Differential and Integral Calculus              | 2010,2011           |
| ○ Further Differential and Integral Calculus                   | 2010,2011           |
| ○ Differential Equations and Linear Algebra                    | 2011,2012           |
| ○ Series, Partial Differential Equations and Fourier Transform | 2010,2011           |
| ○ Linear Programming   | 2009                |
| ○ Nonlinear Optimization                                       | 2009                |

### **Stellenbosch, South Africa**

*January 2009 – July 2012*

## **Research papers and publications**

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- C.V. Beccari, M. Neamtu and M.D. van der Walt, "On the approximation order of rational geometric splines", in preparation.
- H.N. Mhaskar and M.D. van der Walt, "A learning algorithm for predicting blood glucose concentration", in preparation.
- 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**

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Invited talks.....

### **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