# Maria van der Walt | Curriculum Vitae

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September 2016

## Education

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|---|---|
| **University of Missouri-St. Louis** | **St. Louis, MO** |
| *Doctor of Philosophy (Applied Mathematics)* | *May 2015* |

Title of thesis: "Wavelet analysis of non-stationary signals with applications"
Thesis advisor: C.K. Chui

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| **Stellenbosch University** | **Stellenbosch, South Africa** |
| *Master of Science (Mathematics), Cum Laude* | *December 2012* |

Title of thesis: "Ternary interpolatory subdivision"
Supervisor: J.M. de Villiers

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| **Stellenbosch University** | **Stellenbosch, South Africa** |
| *Bachelor of Science (Honors) (Mathematics), Cum Laude* | *December 2010* |

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| **Stellenbosch University** | **Stellenbosch, South Africa** |
| *Bachelor of Science (Mathematical Sciences), Cum Laude* | *December 2009* |

Majors: Mathematics, Applied Mathematics

## Employment history

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| **Vanderbilt University** | **Nashville, TN** |
| *Assistant professor* | *August 2015 – present* |

Courses taught:
- Methods of Linear Algebra — *Fall 2016*
- Accelerated Single-Variable Calculus II — *Summer 2016*
- Differential Equations and Linear Algebra — *Spring 2016*

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| **University of Missouri-St. Louis** | **St. Louis, MO** |
| *Graduate teaching assistant / Instructor* | *January 2013 – May 2015* |

Courses taught as instructor of record:
- Trigonometry — *Spring 2014, Fall 2014, Spring 2015*
- Basic Probability and Statistics — *Spring 2014*
- Intermediate Algebra — *Fall 2013*
- Beginning Algebra — *Fall 2013*

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| **Stellenbosch University** | **Stellenbosch, South Africa** |
| *Temporary lecturer* | *July 2012 – December 2012* |

Courses taught:
- Calculus I

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| **Stellenbosch University** | **Stellenbosch, South Africa** |
| *Tutorial coordinator* | *January 2012 – July 2012* |

Tutorial programs managed:
- Mathemathics for the Biological Sciences

**Stellenbosch University**                                    **Stellenbosch, South Africa**
*Teaching assistant*                                           *January 2009 – July 2012*
Courses tutored:
- 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*

## 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.
- 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.....................................................................................................

**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

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|---|---|
| **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

**Prof. Mike Neamtu**      Dept. of Math. Chair, Vanderbilt University
✉ mike.neamtu@vanderbilt.edu 🕾 (615) 322-1555

**Prof. Charles K. Chui**      PhD thesis advisor
✉ ckchui@stanford.edu 🕾 (650) 853-3034

**Prof. Johan de Villiers**      Master's degree supervisor
✉ jmdv@sun.ac.za 🕾 (+2776) 053-5864

**Prof. Haiyan Cai**      Dept. of Math. Chair, UMSL
✉ haiyan_cai@umsl.edu 🕾 (314) 516-6719

**Prof. H.N. Mhaskar**      Collaborator
✉ hmhaska@caltech.edu 🕾 (323) 343-2150