

## Nicholas J. Wintz

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### Summary

I am a PhD Mathematician. My primary research is in optimal control and estimation (Kalman filter). I also have experience in statistical analysis, programming languages, systems theory, financial mathematics, tracking, mathematical modeling, and more.

### Education

- Ph.D. in Mathematics, December 2009, Missouri University of Science and Technology (formerly University of Missouri-Rolla), Rolla, MO  
Dissertation title: 'The Kalman Filter on Time Scales'  
Advisor: Martin J. Bohner  
Graduate Certificate in Financial Mathematics
- M.A. in Mathematics, May 2004, Marshall University, Huntington, WV  
Thesis title: 'Eigenvalue comparisons for an impulsive boundary value problem with Sturm-Liouville boundary conditions'  
Advisor: Bonita A. Lawrence
- B.S. in Mathematics, May 2002, Marshall University, Huntington, WV  
Minor: Economics

### Experience

- Fall 2009 - Present: Lecturer  
Department of Mathematics and Statistics, Missouri University of Science and Technology  
Courses taught: 'Calculus with Analytic Geometry III' and 'Elementary Differential Equations.'  
Honors student: Abigail Asher, "Using Runge-Kutta methods to solve 1st order chemical engineering models," Differential Equations (Spring 2010).
- Fall 2004 - Spring 2009: Graduate Teaching Assistant - instructor of record.  
Department of Mathematics and Statistics, Missouri University of Science and Technology  
Courses taught: 'College Algebra,' 'Trigonometry,' 'Calculus with Analytic Geometry III,' and 'Elementary Differential Equations.'
- Fall 2003 - Spring 2004: Graduate Research Assistant  
Department of Mathematics and Statistics, Marshall University  
"Eigenvalue comparisons for an impulsive boundary value problem with Sturm-Liouville boundary conditions." (Supervised by Dr. Bonita A. Lawrence).  
"The Winning Probability and A Priori Relative Ranking in the Game of Soccer." (Supervised by Dr. Alfred A. Akinsete).
- Fall 2002 - Spring 2004: Graduate Teaching Assistant - instructor of record.  
Department of Mathematics and Statistics, Marshall University  
Courses taught: 'College Algebra,' 'Concepts and Applications,' and 'Calculus for Business.'

## Publications

1. B.A. Lawrence and N. Wintz. Eigenvalue comparisons for an impulsive boundary value problem with Sturm-Liouville boundary conditions. *Comm. Appl. Nonlinear Anal.* 12, 4 (2005), 37-45.
2. N. Wintz. The Kalman filter on time scales. PhD dissertation, 2009.
3. M. Bohner and N. Wintz. Controllability and observability of time-invariant linear dynamic systems. *Math. Bohem.* (2011). To appear.
4. M. Bohner and N. Wintz. The linear quadratic regulator on time scales. *Int. J. Difference Equ.*, 5, 2 (2010), 149-174.
5. M. Bohner and N. Wintz. The linear quadratic tracker on time scales. *Int. J. Dyn. Syst. Differ. Equ.* (2011). To appear.
6. M. Bohner and N. Wintz. The Kalman filter for linear systems on time scales. To be submitted.
7. J. Seiffertt and N. Wintz. Linear quadratic pursuit-evasion games on time scales. In progress.
8. N. Wintz. Bilinear systems on time scales: solutions and optimal control. In progress.
9. N. Wintz. Extensions to the LQR on time scales. In progress.

## Awards

1. Honorable Mention, "GTA Teaching Excellence Award," Missouri S&T, 2007-08.
2. Honorable Mention, "GTA Teaching Excellence Award," Missouri S&T, 2008-09.

## Journals Reviewed

1. International Journal of Mathematics and Mathematical Sciences
2. Journal of Inequalities and Applications
3. Nonlinear Dynamics and Systems Theory

## Professional Affiliations

- Member, American Mathematical Society (AMS)
- Member, International Society of Difference Equations (ISDE)

## Talks Presented

1. 24th Annual Western Kentucky University Mathematics Symposium, Bowling Green, Kentucky, November 19-20, 2004.
2. The First International Workshop on Dynamic Equations on Time Scales, Istanbul, Turkey, June 27 - July 1, 2005.
3. Recent Developments in Dynamic Equations on Time Scales, University of Wyoming, Laramie, WY, June 8-19, 2009 (Invited Speaker).
4. Fall 2009 Central Sectional Meeting of the American Mathematical Society, Baylor University, Waco, TX, October 16-18, 2009.

## Conferences Attended

1. ICDEA2006, Eleventh International Conference on Difference Equations and Applications, Kyoto, Japan, July 24-28, 2006.

## Seminars Presented

1. Eigenvalue comparisons for an impulsive boundary value problem with Sturm-Liouville boundary conditions, Analysis Seminar, UMR, Oct 27, 2004.
2. An introduction to discrete differential games, Time Scales Seminar, UMR, Jan 31, 2006.
3. Linear systems on time scales, Time Scales Seminar, UMR, Mar 21, 2006.
4. Linear systems on time scales (Part II), Time Scales Seminar, UMR, Mar 23, 2006.
5. Linear systems on time scales (Part III), Time Scales Seminar, UMR, Apr 4, 2006.
6. Linear systems on time scales (Part IV), Time Scales Seminar, UMR, Apr 11, 2006.
7. An Introduction to Game Theory, Graduate Student Seminar, UMR, May 1, 2006.
8. Controllability for dynamic control problems, Time Scales Seminar, UMR, Sep 14, 2006.
9. Observability for dynamic control problems, Time Scales Seminar, UMR, Sep 21, 2006.
10. Controllability, reachability, and observability for time-invariant and time-variant dynamic control problems, Time Scales Seminar, UMR, Nov 16, 2006.
11. Linear stochastic systems on time scales, Time Scales Seminar, UMR, Feb 15, 2007.
12. Propagation of means and covariances in linear stochastic systems on time scales, Time Scales Seminar, UMR, Feb 22, 2007.
13. Error covariance, Time Scales Seminar, UMR, Mar 22, 2007.
14. Derivation of the Kalman filter, Time Scales Seminar, UMR, Aug 29, 2007.
15. Derivation of the steady state Kalman filter, Time Scales Seminar, UMR, Oct 17, 2007.
16. The linear quadratic regulator on time scales, Time Scales Seminar, Missouri S&T, Feb 13, 2008.
17. The linear quadratic regulator on time scales, Student Research Seminar, Missouri S&T, Feb 18, 2008.
18. An Introduction to Time Scales, Kappa Mu Epsilon, Missouri S&T, Apr 1, 2008.
19. Free final state and closed loop control for dynamic equations, Time Scales Seminar, Missouri S&T, Apr 23, 2008.
20. The tracking problem on time scales, Time Scales Seminar, Missouri S&T, Sep 10, 2008.
21. The tracking problem on time scales (Part II), Time Scales Seminar, Missouri S&T, Sep 17, 2008.
22. Derivation of the Kalman filter using the Wiener-Hopf equation, Time Scales Seminar, Missouri S&T, Oct 15, 2008.
23. Regulator as a function with final state fixed, Time Scales Seminar, Missouri S&T, Nov 5, 2008.
24. Regulator as a function with final state fixed (Part II), Time Scales Seminar, Missouri S&T, Nov 12, 2008.
25. Some scalar dynamic control problems, Time Scales Seminar, Missouri S&T, Feb 25, 2009.
26. Some scalar dynamic tracking problems, Time Scales Seminar, Missouri S&T, Mar 4, 2009.
27. The linear quadratic minimum time problem on time scales, Time Scales Seminar, Missouri S&T, Sep 2, 2009.

## References

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