

TYLER J. NIGON

University of Minnesota
Room 2, Biosystems and Agricultural Engineering Building
1390 Eckles Avenue, Saint Paul, MN 55108
Phone: (715) 937-2942
Email: nigo0024@umn.edu
Website: <https://tylernigon.me>

EDUCATION

- Ph.D.** University of Minnesota-Twin Cities; Saint Paul, MN *Exp. 2019
Land and Atmospheric Science
Advisors: Dr. Ce Yang and Dr. David Mulla
Dissertation: *Remote sensing and crop systems modeling to improve nitrogen management in corn: a combined approach*
Concentrations: Precision agriculture, nutrient management, crop systems modeling
- M.S.** University of Minnesota-Twin Cities; Saint Paul, MN 2012
Land and Atmospheric Science
Advisors: Dr. Carl Rosen and Dr. David Mulla
Thesis: *Nigon, T.J. (2012). Aerial imagery and other non-invasive approaches to detect nitrogen and water stress in a potato crop (Master's thesis). U. of M. Digital Conservancy. <http://purl.umn.edu/143695>*
Concentrations: Soil fertility, plant nutrition, remote sensing, precision agriculture
- B.S.** University of Wisconsin-Stevens Point; Stevens Point, WI 2010
Soil and Land Management
Minor study: Geographic Information Systems & Spatial Analysis
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RESEARCH EXPERIENCE

- Graduate Research Assistant** May 2015 - present
Department of Bioproducts and Biosystems Engineering
University of Minnesota, Saint Paul, MN
PIs: Dr. Ce Yang, Dr. David Mulla, and Dr. Daniel Kaiser
- Graduate Research Assistant** May 2010 - Nov 2012
Department of Soil, Water, & Climate
University of Minnesota, Saint Paul, MN
Project Title: *Fusion of Hyperspectral and Thermal Imagery for the Detection of Nitrogen and Water Stress in Potato*
PIs: Dr. Carl Rosen and Dr. David Mulla
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RESEARCH EXPERIENCE (*continued*)

Undergraduate Research Team Member Sep 2007 - May 2010
 Soil and Water Conservation Society
 UW-Stevens Point Student Chapter, Stevens Point, WI
 Project Title: *Creating a nutrient density map of the Horicon Marsh*
 PI: Dr. Steven Levine

PROFESSIONAL EXPERIENCE

Aglytix, Mankato, MN
Product Manager Feb 2014 – Sep 2015
 Jim Cowan Agency (Pioneer Seed Sales), Burlington, WI
Sales Associate Mar 2013 - Feb 2014
 Soil & Waste Department, UW-SP, Stevens Point, WI
Laboratory Assistant Sep 2007 - May 2010
 Northside Elevator, Inc., Loyal, WI
Intern Agronomist May - Sep 2009
 Nigon-View Dairy (family farm), Greenwood, WI
Farm Hand 2000 - 2010

REFEREED JOURNAL PUBLICATIONS

- 4) Vashisht, B.B., **T.J. Nigon**, D.J. Mulla, C.J. Rosen, H. Xu, T. Twine, and S.K. Jalota. (2015). Adaptation of water and nitrogen management to future climates for sustaining potato yield in Minnesota: Field and simulation study. *Agricultural Water Management*, 152, 198-206. DOI: 10.1016/j.agwat.2015.01.011
- 3) **Nigon, T.J.**, D.J. Mulla, C.J. Rosen, Y. Cohen, V. Alchanatis, J. Knight, and R. Rud. (2015). Hyperspectral aerial imagery for detecting nitrogen stress in two potato cultivars. *Computers and Electronics in Agriculture*, 112, 36-46. DOI: 10.1016/j.compag.2014.12.018
- 2) Rud, R., Y. Cohen, V. Alchanatis, A. Levi, R. Brikman, C. Shenderey, B. Heuer, T. Markovitch, Z. Dar, C. Rosen, D. Mulla, and **T. Nigon**. (2014). Crop water stress index derived from multi-year ground and aerial thermal images as an indicator of potato water status. *Precision Agriculture*, 15, 273-289. DOI: 10.1007/s11119-014-9351-z
- 1) **Nigon, T.J.**, D.J. Mulla, C.J. Rosen, Y. Cohen, V. Alchanatis, and R. Rud. (2014). Evaluation of the nitrogen sufficiency index for use with high resolution, broadband aerial imagery in a commercial potato field. *Precision Agriculture*, 15, 202-226. DOI: 10.1007/s11119-013-9333-6

INVITED PRESENTATIONS

- 7) **Nigon, T.J.** (2019). [Drones in agriculture: past, present, and future](#). 7 February 2019. *AgroFIELD Akadémia Konferencia*, Four Points Conference Center, Kecskemét, Hungary.
- 6) **Nigon, T.J.** (2018). Non-invasive tools for in-season nitrogen management. 12 January 2018. *2018 Winter Crop Days*, Heinz Center, Rochester, MN & So. Research and Outreach Center, Waseca, MN.
- 5) **Nigon, T.J.** (2015). How data gathering by unmanned aerial vehicles can help farm operators with decision-making. 24-26 February 2015. *Central MN Farm Show*, Rivers Edge Convention Center, St. Cloud, MN.
- 4) **Nigon, T.J.** (2015). Assessment of field variability for precision agriculture. 10 February 2015. *UMN Production Agriculture Symposium*, University of Minnesota, Saint Paul, MN.
- 3) **Nigon, T.J.** (2014). Integrated solutions using UAV technology. 2 December 2014. *Corn & Soybean Management 2014*, Eagles Club, 917 15th Ave SE, Rochester, MN.
- 2) **Nigon, T.J.** (2014). Unmanned aerial mapping. 15 October 2014. *Sixth annual South Dakota Invasive Species Management Association*, SD Game, Fish, & Parks Outdoor Campus West, Rapid City, SD.
- 1) **Nigon, T.J.** (2014). Use of computer vision, spectral data, and analytics to improve the location of agricultural inputs. 5 August 2014. *12th annual Nitrogen Use Efficiency Conference*, South Dakota State University, Sioux Falls, SD.

CONFERENCE PROCEEDINGS

- 4) Laacouri, A., T. Nigon, D.J. Mulla, & C. Yang. (2018). A Case Study Comparing Machine Learning and Vegetation Indices for Assessing Corn Nitrogen Status in an Agricultural Field in Minnesota. *Proceedings of the 14th International Conference on Precision Agriculture*, Montreal, Quebec. ([online only](#))
 - 3) **Nigon, T.J.**, C. Yang, & D.J. Mulla. (2018). Utilization of Spatially Precise Measurements to Autocalibrate the EPIC Agroecosystem Model. *Proceedings of the 14th International Conference on Precision Agriculture*, Montreal, Quebec. ([online only](#))
 - 2) Cohen, Y., V. Alchanatis, B. Heuer, H. Lemcoff, M. Springstin, C.J. Rosen, D.J. Mulla, **T.J. Nigon**, Z. Dar, A. Cohen, A. Levi, R. Brikman, T. Markovits, & R. Rud. (2012). Evaluating Water Status in Potato Fields Using Combined Information from RGB and Thermal Aerial Images. 17 July 2012. *Proceedings of the 11th International Conference on Precision Agriculture*, Indianapolis, IN. ([online only](#))
 - 1) **Nigon, T.J.**, C.J. Rosen, D.J. Mulla, Y. Cohen, V. Alchanatis, & R. Rud. (2012). Hyperspectral imagery for the detection of nitrogen stress in potato for in-season management. *Proceedings of the 11th International Conference on Precision Agriculture*, Indianapolis, IN. ([online only](#))
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CONTRIBUTED ORAL PRESENTATIONS (*with abstracts*)

- 3) **Nigon, T.J.**, B. Bohman, C.J. Rosen, & D.J. Mulla. (2017). Utilizing remote sensing for variable-rate nitrogen and irrigation management in potato. 23 October 2017. *International annual meeting of ASA-CSSA-SSSA*, Tampa Bay, FL. ([link to abstract](#))
- 2) **Nigon, T.J.**, C.J. Rosen, D.J. Mulla, Y. Cohen, V. Alchanatis, & R. Rud. (2012). Hyperspectral imagery for the detection of nitrogen stress in potato for in-season management. 17 July 2012. *11th International Conference on Precision Agriculture*, Indianapolis, IN. ([link to abstract](#))
- 1) **Nigon, T.J.**, C.J. Rosen, & D.J. Mulla. (2011). Fusion of hyperspectral and thermal imagery for evaluating nitrogen and water status in potato for variable rate application. 17 October 2011. *International annual meeting of ASA-CSSA-SSSA*, San Antonio, TX. ([link to abstract](#))

CONTRIBUTED POSTER PRESENTATIONS (*with abstracts*)

- 6) **Nigon, T.J.**, D.J. Mulla, & C. Yang. (2018). Independent calibration of the EPIC model using in-season aerial imagery. 5 November 2018. *International annual meeting of ASA-CSSA-SSSA*, Baltimore, MD. ([link to abstract](#)) (*1st of 7 in poster competition*)
- 5) **Nigon, T.J.**, D. Kaiser, C. Yang, & D.J. Mulla. (2017). Active and passive spectral sensing for predicting the optimum nitrogen rate and timing in corn. 15-16 November 2017. *47th North Central extension-industry soil fertility conference*, Des Moines, IA. ([link to abstract](#)) (*2nd of 29 in poster competition*)
- 4) **Nigon, T.J.**, A. Laacouri, C. Yang, & D.J. Mulla. (2017). Spectral imagery to estimate leaf area index and above-ground biomass in maize. 23 October 2017. *International annual meeting of ASA-CSSA-SSSA*, Tampa Bay, FL. ([link to abstract](#)) (*3rd of 16 in poster competition*)
- 3) **Nigon, T.J.**, C. Yang, D.J. Mulla, & D. Kaiser. (2016). Tetraby: a Python package for cleaning and preprocessing Tetracam multispectral imagery. 9 November 2016. *International annual meeting of ASA-CSSA-SSSA*, Phoenix, AZ. ([link to abstract](#))
- 2) **Nigon, T.J.**, C.J. Rosen, & D.J. Mulla. (2012). Plant-based approaches for in-season detection of nitrogen stress in potato. 24 October 2012. *International annual meeting of ASA-CSSA-SSSA*, Cincinnati, OH. ([link to abstract](#))
- 1) **Nigon, T.J.**, C.J. Rosen, D.J. Mulla, Y. Cohen, V. Alchanatis, & R. Rud. (2011). Hyperspectral and thermal imagery for the detection of nitrogen and water stress. 16-17 November 2011. *41st North Central extension-industry soil fertility conference*, Des Moines, IA.

PATENTS

- 1) Johnson, J.D., **Nigon, T.J.**, Abouali, M. (2016). Crop Stand Analysis – a method and system for determining crop stand count using aerial imagery. **U.S. Patent No. 9,489,576**. Issued 8 Nov 2016.
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TEACHING EXPERIENCE

Substitute instructor: Remote Sensing of Vegetation Environmental Physics (ESPM 3131): U of M-Twin Cities	27 Apr 2017
Substitute instructor: How GPS Works Environmental Physics (ESPM 3131): U of M-Twin Cities	25 Apr 2017
Guest lecture: Remote Sensing for High Throughput Phenotyping Topics in Applied Plant Sciences (HORT/AGRO 8280): U of M-Twin Cities	1 Feb 2017
Guest lecture: Overview of the CropScan Multispectral Radiometer Advanced Remote Sensing and Geospatial Analysis (FNRM 5412): U of M-Twin Cities	9 Feb 2016
Guest lecture: Managing Spatial Variability for Precision Agriculture Applications Precision Agriculture (SOIL 4111): U of M-Twin Cities	23 Feb 2015

HONORS AND AWARDS

13) Outstanding Graduate Student Award – International Society of Precision Agriculture Recognizes graduate student achievement, training, preparation, and research in the area of precision agriculture. It is awarded to ten graduate students that presented their research at the 14 th International Conference on Precision Agriculture in Montréal, Quebec.	Jun 2018
12) President's Student Leadership and Service Award – UMN Recognizes the accomplishments and contributions of outstanding student leaders at the University of Minnesota-Twin Cities. It is presented to approximately one-tenth of one percent of the student body for their exceptional leadership and service to the University of Minnesota and the surrounding community.	Apr 2018
11) Future Leaders in Science Award – Congressional Visits Day, Washington, DC Recipients receive policy, communication, and advocacy training to learn how to effectively work with members of Congress and their staff, then get the opportunity to meet with Congressional delegation; sponsored by the American Society of Agronomy.	Mar 2018
10) Graduate Student Poster Presentation Competition – Des Moines, IA (\$200) North Central extension-industry soil fertility conference – 2 nd place of 29	Nov 2017
9) International Plant Nutrition Institute Regional Scholar Award (\$300)	Nov 2017
8) Graduate Student Poster Presentation Competition – Tampa, FL (\$100) International annual meeting of ASA-CSSA-SSSA – 3 rd place of 16	Nov 2017

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| 7) | University of Minnesota Informatics Institute MnDRIVE Research Assistantship
Financially supports UMN Ph.D. graduate students pursuing research at the intersection of informatics and any of the four MnDRIVE areas: <i>i)</i> Robotics, sensors, and advanced manufacturing; <i>ii)</i> global food ventures; <i>iii)</i> advancing industry while conserving our environment; and <i>iv)</i> discoveries and treatments for brain conditions. | 2017 – 2018 |
| 6) | Graduate Student Leadership Conference
The American Society of Agronomy awards 75 graduate students to participate in skills sessions to improve speaking, professionalism, leadership, science communication, and ethics. | Nov 2016 |
| 5) | MnDRIVE Global Food Ventures Fellowship (\$33,500)
Supports graduate students conducting research in the areas of food systems, safety, and security; it provides professional development opportunities to broaden the understanding of food production, processing, protection, and policy to advance Minnesota food economies. | 2016 - 2017 |
| 4) | International Plant Nutrition Institute Scholarship (\$2000) | Oct 2011 |
| 3) | Hueg-Harrison Fellowship – UMN (\$26,500)
Recognizes graduate students with an excellent academic record and the relationship forged between the student and advisor. | 2011 - 2012 |
| 2) | Chancellor’s Leadership Award – UWSP
Honors graduating students who have contributed leadership, demonstrated campus and community service, and have shown a commitment to personal growth throughout their UWSP career. | May 2010 |
| 1) | Outstanding Soil and Waste Resources Student – UWSP
Honors a student who has an excellent academic record and has shown leadership within the department. | May 2010 |
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PROFESSIONAL MEMBERSHIPS AND ACTIVITIES

Memberships:

American Society of Agronomy & Soil Science Society of America	Since 2008
Soil and Water Conservation Society	Since 2008
International Society of Precision Agriculture	Since 2012
Soil & Water Conservation Society – UW-Stevens Point Student Chapter	2007 - 2010
President	2009 - 2010
Treasurer	2008 - 2009

Journal Reviews:

Journal of Selected Topics in Applied Earth Observations and Remote Sensing	2015
International Journal of Remote Sensing (x2)	2017 – ‘18
Computers and Electronics in Agriculture (x2)	2017 – ‘18

Review Committees:

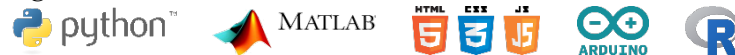
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| <p>Precision Nutrient Management Search Committee
 <i>Department of Soil, Water, & Climate, University of Minnesota</i>
 Served on the search committee for Precision Nutrient Management faculty position</p> | <p>2016 - 2017</p> |
| <p>Travel Grants Committee
 <i>Council of Graduate Students, University of Minnesota</i>
 Reviewed grant applications and served on a team to delegate funding to students</p> | <p>2016 - 2017</p> |

PROFESSIONAL PHILOSOPHY

I believe there is work to be done to make the implementation of the 4Rs of nutrient stewardship (i.e., **R**ight source, **R**ight rate, **R**ight time, and **R**ight Place) easier and more effective for growers and other stakeholders. As a society, we must be more proactive in establishing a balance among the economic, environmental, and social ecosystems that are influenced by agriculture. My work involves conducting research and developing tools to establish a working balance among these ecosystems.

COMPUTING & TECHNICAL SKILLS

Languages:



General:



GIS:



REFERENCES AVAILABLE UPON REQUEST