

Sydney N. Williams

Imaging Centre of Excellence (ICE)
Queen Elizabeth University Hospital
1345 Govan Road
Glasgow, UK G51 4TF

sydney.williams@glasgow.ac.uk
sydneynw.github.io

January 26, 2021

EDUCATION	University of Michigan , Ann Arbor, MI <i>Ph.D.</i> , Biomedical Engineering, September 2018 <i>Dissertation</i> : Constrained and Spectral-Spatial RF Pulse Design for Magnetic Resonance Imaging <i>M.S.E.</i> , Electrical & Computer Engineering, December 2017 <i>M.S.E.</i> , Biomedical Engineering, April 2015	
	Illinois Institute of Technology , Chicago, IL <i>B.S.</i> , Biomedical Engineering, May 2013 (<i>Summa Cum Laude</i>)	
	Universidad Politécnica de Madrid , Madrid, Spain Visiting semester in telecommunications engineering with courses instructed in Spanish	
RESEARCH EXPERIENCE	Postdoctoral Research Assistant October 2018-Present Imaging Centre of Excellence (ICE) Supervisor: Dr. David A. Porter <ul style="list-style-type: none">• Parallel transmit (pTx) excitation for 7 tesla magnetic resonance imaging (MRI)• Safety and validation of radiofrequency (RF) coils• Siemens MRI pulse sequence programming	University of Glasgow Glasgow, UK
	Graduate Research Assistant September 2013-September 2018 fMRI Laboratory Supervisors: Dr. Douglas C. Noll and Dr. Jeffrey A. Fessler <ul style="list-style-type: none">• Multi-dimensional RF pulse design• Steady-state MRI sequences• GE MRI pulse sequence programming	University of Michigan Ann Arbor, MI
	Undergraduate Research Assistant June 2012-December 2012 Medical Informatics Laboratory Supervisors: Dr. Daniela Raicu and Dr. Jacob Furst <ul style="list-style-type: none">• NSF-funded Research Experience for Undergraduates (REU)• Data mining and machine learning for CT image classification• Evaluation metrics for probabilistic multiclass classifiers.	DePaul University Chicago, IL
	The Physics of Medical Imaging Spring 2020, 2021 Guest lecturer and exam writer for joint MSc Medical Physics and BSc Biomedical Engineering Course <ul style="list-style-type: none">• Lecture and exam questions on MRI Hardware	University of Glasgow Glasgow, UK
TEACHING EXPERIENCE	Music Signal Processing Fall 2015 Graduate student instructor for freshman undergraduate lab and lecture course Course Instructor: Dr. Jeffrey A. Fessler <ul style="list-style-type: none">• Course topics: technical communications skills, signal sampling, continuous vs. discrete signals, Fourier/spectral analysis, and basic concepts of music theory	University of Michigan Ann Arbor, MI

- Teaching tasks: directing program labs where students engaged in labs and projects, holding weekly office hours, grading lab reports

Biomedical Engineering Lab

Winter/Spring 2015

University of Michigan

Ann Arbor, MI

Graduate student instructor for third-year undergraduate lab and lecture course

Course Instructors: Dr. Dennis Clafin and Dr. Douglas C. Noll

- Course topics: electronic circuits, materials testing, cell culture, basic statistics, and experimental design
- Teaching tasks: organizing morning lab session, overseeing undergraduate instructor aide, grading lab reports, holding weekly office hours, and giving guest statistics lecture

Intro to Biomedical Engineering

Fall 2012

Illinois Institute of Technology

Chicago, IL

Teaching assistant for freshman undergraduate lab and lecture course

Course Instructor: Dr. Bonnie Haferkamp

- Course topics: tissue engineering, neural engineering, and medical imaging
- Teaching tasks: developing experimental protocols, setting up laboratory experiments, and grading lab reports

Intro to Calculus

Spring 2012

Illinois Institute of Technology

Chicago, IL

Teaching assistant for freshman undergraduate architecture students

Course Instructor: Dr. David Maslanka

- Course topics: limits, derivatives, integrals, and other calculus fundamentals
- Teaching tasks: grading worksheets, tutoring students, and holding exam reviews

Geometry for Architects

Fall 2010 and Fall 2011

Illinois Institute of Technology

Chicago, IL

Teaching assistant for freshman undergraduate architecture students

Course Instructor: Dr. David Maslanka

- Course topics: basic geometry and proofs, pre-calculus, and trigonometry
- Teaching tasks: grading worksheets, tutoring students, and holding exam reviews

OTHER EXPERIENCE

Software Developer Intern

Summer 2013

Dialysis Clinic, Inc.

Chicago, IL

- Developer on support team for the largest non-profit US dialysis company
- Solved user-reported problems via communication and technical skills such as SQL, Classic ASP, and report design with SQL Server Reporting Services (SSRS)

Private Tutor

2013

Varsity Tutors

Chicago, IL

- Tutor for middle school, high school, and college students
- Calculus, Physics, Chemistry, ACT Math and Science, and Spanish Language

JOURNAL PAPERS

1. **S. N. Williams**, S. Allwood-Spiers*, P. McElhinney*, G. Paterson, J. Herrler, P. Liebig, A. Nagel, J. E. Foster, D. A. Porter, G. Shajan, "A 7 tesla head coil Using a nested transmit array for improved decoupling performance", *In Preparation*.
2. **S. N. Williams**, J-F. Nielsen, J.A. Fessler, and D.C. Noll, "Slab-selective prewinding pulses for steady-state imaging", *In Preparation*.
3. **S. N. Williams**, J-F. Nielsen, J.A. Fessler, and D.C. Noll, "Design of spectral-spatial prewinding pulses and their use in small-tip fast recovery steady-state imaging", *Mag. Reson. Med.*, vol. 79(3), March 2018. doi: [10.1002/mrm.26794](https://doi.org/10.1002/mrm.26794).

*denotes equal authorship

CONFERENCE PUBLICATIONS

1. **S. N. Williams***, S. Allwood-Spiers*, P. McElhinney, Y. Tao, J. E. Foster, D. A. Porter, S. Gunamony, "Validation and safety approval of a dual-mode head coil for pTx applications in vivo at 7 tesla", *Proc. Int. Soc. Mag. Reson. Med.* (ISMRM), 2020, Virtual. [Abstract](#). [Presentation](#).
2. **S. N. Williams**, S. Allwood-Spiers, P. McElhinney, Y. Tao, J. E. Foster, D. A. Porter, S. Gunamony, "First in vivo images from an in-house parallel transmit coil for MRI at 7 tesla", *Ann. Sci. Meet. Scot. Imag. Net. Plat. Sci. Exc.* (SINAPSE ASM), 2020, Virtual. [Poster](#). [Power Pitch](#).
3. S. Allwood-Spiers, P. McElhinney, **S. N. Williams**, Y. Tao, J. E. Foster, D. A. Porter, S. Gunamony, "Safety validation of a custom-built head coil for 7T human scanning", *Ann. Sci. Meet. Scot. Imag. Net. Plat. Sci. Exc.* (SINAPSE ASM), 2020, Virtual.
4. P. McElhinney, S. Allwood-Spiers, **S. N. Williams**, Y. Tao, J. E. Foster, D. A. Porter, S. Gunamony, "Numerical optimisation of an open-faced head coil design for MRI at 7 tesla", *Ann. Sci. Meet. Scot. Imag. Net. Plat. Sci. Exc.* (SINAPSE ASM), 2020, Virtual.
5. **S. N. Williams**, P. McElhinney, S. Allwood-Spiers, Y. Tao, J. E. Foster, D. A. Porter, S. Gunamony, "Comparing the practical effects of VOP compressions for SAR monitoring at 7 T", *MN Workshop U.H.F. Im.*, 2019, Minneapolis, Minnesota, USA. [Abstract](#).
6. G. Bruce, G. Keith, **S. Williams**, D. Porter, "The effect of B_1 variation on T_1 estimates at 7 tesla", *Proc. Brit. Chap. Int. Soc. Mag. Reson. Med.* (BC-ISMARM), 2019, Sheffield, England, UK. [Abstract](#).
7. M. Gil, **S. Williams**, G. Keith, D. Porter, "The effect of B_1^+ inhomogeneity and slice profile on spin-echo sequences at 7 tesla: computer simulation and experimental validation", *Proc. Brit. Chap. Int. Soc. Mag. Reson. Med.* (BC-ISMARM), 2019, Sheffield, England, UK. [Abstract](#).
8. **S. N. Williams**, J-F. Nielsen, J.A. Fessler, and D.C. Noll, "A simple method for constrained optimal control RF pulse design", *Proc. Int. Soc. Mag. Reson. Med.* (ISMRM), 2019, Montreal, Canada. [Abstract](#).
9. **S. N. Williams**, J-F. Nielsen, J.A. Fessler, and D.C. Noll, "Slab-selective spectral and spectral-spatial prewinding RF pulses", *Proc. Int. Soc. Mag. Reson. Med.* (ISMRM), 2018, Paris, France. [Abstract](#).
10. **S. N. Williams**, D.C. Noll, and J.A. Fessler, "Minimum out-of-slice error SMS RF pulse design with direct peak, power, and in-slice error constraints", *Proc. Eur. Soc. Mag. Reson. Med. Biol.* (ESMRMB), 2017, Barcelona, Spain. [E-poster](#).
11. **S. N. Williams**, D.C. Noll, and J.A. Fessler, "Improved simultaneous multislice pulse design directly constraining peak RF amplitude,"", *Proc. Int. Soc. Mag. Reson. Med.* (ISMRM), 2017, Honolulu, HI, USA. [Abstract](#).
12. **S. N. Williams**, D.C. Noll, and J.A. Fessler, "Spectral-spatial RF pulse design with direct constraints on peak amplitude and integrated power", *In Vivo MR Gordon Research Conference*, 2016, Andover, NH, USA.
13. **S. Williams**, H. Sun, J-F. Nielsen, J.A. Fessler, and D.C. Noll, "A spectral-spatial pulse for improved signal recovery in the small-tip fast recovery sequence", *Proc. Int. Soc. Mag. Reson. Med.* (ISMRM), 2015, Toronto, Canada. *Magna Cum Laude Award*. [Abstract](#).
14. **S. Williams**, M. Harris, J. Furst, and D. Raicu, "Area under the distance threshold curve as an evaluation measure for probabilistic classifiers," *Proc. Mach. Learn. Data Min.* (MLDM), 2013, New York City, NY, USA. doi: [10.1007/978-3-642-39712-749](#).

*denotes equal authorship

PRESENTATIONS

1. “SAR Management with Custom 7 Tesla pTx Coils”, *Siemens Healthineers EMEA Internal Meeting*, Invited Talk, Virtual, To Occur: February 2021.
2. “Applications of RF pulse designs: inner volume imaging, SMS, B1 shimming & pTx”, *Proc. Int. Soc. Mag. Reson. Med.*, Invited Educational Talk, Virtual, August 2020. [Syllabus](#). [Presentation](#).
3. “Parallel transmit (pTx) techniques for improved image quality”, *Neuro-oncology ICE 7 T visit*, Glasgow, Scotland, UK, Oct. 2019.
4. “Initial investigation of a spokes slice-selective pTx RF pulse design for MRI at 7 tesla”, *SINAPSE Annual Scientific Meeting*, Dundee, Scotland, UK, June 2019.
5. “Slab-selective spectral and spectral-spatial prewinding RF pulses”, *Proc. Int. Soc. Mag. Reson. Med.*, Paris, France, June 2018.
6. “Radio frequency pulse design for target magnetic resonance imaging applications”, *Northwestern U. Biomed. Eng. Dept. Seminar*, Chicago, IL, Feb. 2018.
7. “Radio frequency pulse design for target magnetic resonance imaging applications”, *UMich. Phys. Grad. Student Symposium*, Ann Arbor, MI, Aug. 2017.
8. “Exciting spins: radio frequency pulse design strategies for magnetic resonance imaging”, *UMich. Biomed. Eng. Grad. Student Speaker Series*, Ann Arbor, MI, Aug. 2015.
9. “A spectral-spatial pulse for improved signal recovery in the small-tip fast recovery sequence”, *Proc. Int. Soc. Mag. Reson. Med.*, Toronto, Canada, May 2015.

STUDENT SUPERVISION

1. **Iain Taylor**, Primary Supervisor
University of Glasgow Medical Physics MSc Dissertation Research
Thesis: “Design of generalizable parallel transmit (pTx) radiofrequency (RF) pulses for mitigating RF field inhomogeneity of 7T brain MRI” 2020
2. **George Bruce**, Secondary Supervisor
University of Glasgow Medical Physics MSc Dissertation Research
Thesis: “Optimization of 7 tesla MRI sequence parameters by measuring human brain relaxation times in vivo” 2019
3. **Matthew Gil**, Tertiary Supervisor
University of Glasgow Medical Physics MSc Dissertation Research
Thesis: “The effect of B1 inhomogeneity and slice profile on MRI pulse sequences at 7 tesla: computer simulation and experimental validation” 2019

AWARDS

Triumph Over Adversity Award
University of Michigan Rackham Merit Fellows Program 2017

Graduate Assistance in Areas of National Need Fellowship
University of Michigan Department of Biomedical Engineering 2014-2016

Outstanding Poster Award
In Vivo Magnetic Resonance Gordon Research Conference 2016

Magna Cum Laude Presenter’s Award
International Society of Magnetic Resonance in Medicine (ISMRM) 2015

Honorable Mention of Graduate Research Fellowship
National Science Foundation (NSF) 2014

University of Michigan Graduate Fellowship
University of Michigan Department of Biomedical Engineering 2013-2014

Illinois Institute of Technology Camras Scholar
Full-tuition academic scholarship 2009-2013

Orfalea Scholar
Private local scholarship from the San Luis Obispo Community Foundation 2009-2013

SERVICE/ AFFILIATIONS	International Society for Magnetic Resonance in Medicine (ISMRM)	
	Trainee Member	2014-Present
	Committee member of: High Field Study Group, Engineering Study Group, British and Irish Chapter, and Iberian Chapter	
	Abstract reviewer	
	Eur. Society for Magnetic Resonance in Medicine and Bio. (ESMRMB)	
	Trainee member	2017-Present
	Ladies of Code Glasgow	
	Member	2019-Present
	IEEE Int. Conf. on Acoustics, Speech, & Signal Processing (ICASSP)	
	Invited Paper Reviewer	2021
	Graduate Society of Women Engineers (GradSWE)	
	Student member and elementary outreach team leader	2015-2017
	University of Michigan Biomedical Engineering Graduate Student Council	
	Co-president leading academic, professional, and social events for the graduate students of the UM BME department	2014-2018
	Big Brothers Big Sisters of Washtenaw County	
	Volunteer big sister for high school student	2014-2016
	TAAL Indian Fusion Dance	
	Member of competitive University of Michigan cultural dance team	2013-2015
	Biomedical Engineering Society (BMES)	
	Student member	2012-2013
	Order of Omega Honors Greek Society	
	Member invited as top 3% of academic class	2012-2013
	Tau Beta Pi	
	Member of national honors engineering society	2011-2013
	Kappa Phi Delta	
	Member and elected president of local sorority at Illinois Inst. of Tech.	2009-2013
	Spanish Language Certification	
	B2 Advanced-Intermediate Level Dipoloma by the Institute of Cervantes	2011