



# Benjamin P. Russo

## Contact Information

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Oak Ridge National Laboratory  
Computer Science and Mathematics Division

## Education/ Employment

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<b>Postdoctoral Research Associate</b> <i>Oak Ridge National Laboratory - CSMD</i>	Current
<b>Assistant Professor</b> <i>Farmingdale State College SUNY</i>	September 2018 - August 2021
<b>Visiting Assistant Professor</b> <i>University of Connecticut</i>	August 2016 - August 2018
<b>Ph.D in Mathematics</b> <i>University of Florida, Advisor: Scott McCullough</i>	May 2016
<b>M.S. in Mathematics</b> <i>University of Florida</i>	May 2012
<b>B.S. in Mathematics and Physics</b> <i>University of Florida</i>	May 2010

## Publications

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### The 3-isometric Lifting Theorem

*Integral Equations and Operator Theory*, Volume 84, no. 1, 69–87, with Scott McCullough

### Lifting Commuting 3-Isometric Tuples

*Operators and Matrices*, Volume 11, no. 2, 397–433.

### The Mittag Leffler Reproducing Kernel Hilbert Spaces of Entire and Analytic Functions

*Journal of Mathematical Analysis and Applications*, Volume 463, Issue 2, 576–592, with Joel Rosenfeld and Warren Dixon

### Occupation Kernels and Densely Defined Liouville Operators for System Identification

*2019 IEEE Conference on Decision and Control Proceedings*, with Joel Rosenfeld, Rushikesh Kamalapurkar, and Taylor T Johnson

## In Submission (\* indicates an arXiv link)

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### Motion Tomography via Occupation Kernels\*

with Rushikesh Kamalapurkar, Dongsik Chang, and Joel Rosenfeld

### Theoretical Foundations for Higher Order Dynamic Mode Decomposition\*

with Joel Rosenfeld and Rushikesh Kamalapurkar.

### The Occupation Kernel Method for Nonlinear System Identification\*

with Joel Rosenfeld, Rushikesh Kamalapurkar, and Taylor T Johnson

### Non-commutative disintegrations: existence and uniqueness in finite dimensions\*

with Arthur Parzygnat

### A non-commutative Bayes' theorem\*

with Arthur Parzygnat

## Skills

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**Python** – Intermediate, **MATLAB** – Intermediate, **LaTeX** – Fluent.

## Research Interests

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Functional Analysis, Operator Theory, Matrix Analysis, Applied Functional Analysis, Reproducing Kernel Hilbert Spaces, Quantum Information Theory, Machine Learning for Dynamical Systems and Engineering.

## Invited Talks

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**AMS Special Session on Operators, Function Spaces, and Models** (January 2016)

*Sub-Jordan Operator Tuples*

**IWOTA Special Session on Multivariable Operator Theory** (July 2016)

*Sub-Jordan Operator Tuples*

**Graduate Mathematics Association**, University of Florida (February 2016)

*Dilations and Completely Positive Maps*

**SIGMA Seminar**, University of Connecticut (October 2016)

*Dilations and Completely Positive Maps*

**AMS Sectional Meeting Special Session**, Indiana University (April 2017)

*A Generalization of the Fock Space*

**AMS Special Session on Operators on Function Spaces, JMM** (January 2018)

*A Generalization of the Fock Space*

**AMS Special Session**, University of Delaware (September 2018)

*$C^*$ -algebras and the Category of Stochastic Maps*

**WINRS Special Session**, University of Virginia (September 2018)

*Fractional Derivatives and the Segal Bargmann Space*

**AMS Special Session on Multivariable Operator Theory, JMM** (January 2019)

*$C^*$ -algebras and the Category of Stochastic Maps*

**IWOTA Special Session on Free-Analysis and Free Probability** (July 2019)

*$C^*$ -algebras and the Category of Stochastic Maps*

**AMS Special Session on Recent Progress in Operator Theory** (November 2019)

*Occupation Kernels and Liouville Operators*

**American Control Conference Workshop** (June 2020)

*Motion Tomography via Occupation Kernels*

## Talks

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**Graduate Mathematics Association**, University of Florida (September 2014)

*My Love/Hate Relationship with the Cantor Set*

**Southeastern Analysis Meeting**, University of Georgia (March 2015)

*The Equivalence of Lifting and Factorization for 3-Isometric Tuples*

**Great Plains Operator Theory Symposium**, Purdue University (May 2016)

*The Equivalence of Lifting and Factorization for 3-Isometric Tuples*

**Southeastern Analysis Meeting**, University of South Florida (March 2016)

*Multivariate Lifting Theorems with an Application*

**Southeastern Analysis Meeting**, University of Tennessee (March 2017)

*A Generalization of the Fock Space*

**Hilbert Function Spaces**, Gargnano, Italy (May 2017)

*A Generalization of the Fock Space*

**UConn Math Club**, University of Connecticut (October 2017)

*The Game of Hex*

**Northeastern Analysis Meeting**, University of Albany (October 2017)

*A Generalization of the Fock Space*

**Southeastern Analysis Meeting**, University of Alabama (March 2019)

*C\*-algebras and the Category of Stochastic Maps*

## **Conferences Attended**

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**Southeastern Analysis Meeting**, Virginia Tech (March 2013)

**Southeastern Analysis Meeting**, Clemson University (March 2014)

**Southeastern Analysis Meeting**, University of Georgia (March 2015)

**Great Plains Operator Theory Seminar**, Purdue University (May 2015)

**Southeastern Analysis Meeting**, University of South Florida (March 2016)

**IWOTA**, Washington University in St. Louis (July 2016)

**Southeastern Analysis Meeting**, University of Tennessee (March 2017)

**AMS Sectional Meeting**, University of Indiana (April 2017)

**Hilbert Function Spaces**, Gargnano, Italy (May 2017)

**Northeastern Analysis Meeting**, University of Albany, (October 2017)

**Joint Mathematics Meeting**, (January 2018)

**AMS Sectional Meeting**, University of Delaware (September 2018)

**WINRS**, University of Virginia (September 2018)

**Joint Mathematics Meeting**, (January 2019)

**Southeastern Analysis Meeting**, University of Alabama (March 2019)

**AMS Sectional** University of Florida (November 2019)

## **Referee Activity**

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Operators and Matrices

Annales de l'institut Fourier

Banach Journal of Mathematical Analysis

Czechoslovak Mathematical Journal

## **Undergraduate Research Mentoring**

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**Periodic Cycles on the Riemann Sphere under Möbius Transformations**

with Anthony Ercolano

## **Teaching Experience**

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### **Courses taught at Farmingdale State College SUNY**

MTH 107 - Introduction to Mathematical Ideas

MTH 116 - College Algebra

MTH 129 - Pre-Calculus

MTH 130 - Calculus I with Applications

MTH 150 - Calculus I

MTH 151 - Calculus II

MTH 322 - Advanced Mathematical Analysis

MTH 354 - Principles of Real Analysis

MTH 390 - Methods in Operations Research

### **Courses taught at University of Connecticut**

MATH 1070 - Mathematics for Business and Economics

MATH 1131Q - Calculus I

MATH 2210Q - Applied Linear Algebra

MATH 2710 - Transition to Advanced Mathematics  
MATH 3210 - Abstract Linear Algebra  
MATH 3150 - Analysis I

### **Courses taught at University of Florida**

#### *Instructor*

MGF 1106 - Mathematics for Liberal Arts Majors  
MAC 2312 - Analytic Geometry and Calculus II  
MAP 2302 - Elementary Differential Equations

#### *AIM Instructor*

MAC 1105 - Basic College Algebra

#### *Online Instructor*

MAC 1147 - Pre-Calculus and Trigonometry

#### *Lecturer*

MAC2313 - Analytic Geometry and Calculus III

#### *Discussion Leader*

MAC 1140 - Pre-calculus Algebra  
MAC 1105 - Basic College Algebra  
MGF 1106 - Mathematics for Liberal Arts Majors  
MAC 2311 - Analytic Geometry and Calculus I  
MAC 2312 - Analytic Geometry and Calculus II  
MAC 2313 - Analytic Geometry and Calculus III

### **Course Development**

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Online Course Development for MAC 2313 at UF	Spring 2015 - Summer 2015
Course Development for MTH 129 at Farmingdale	Spring 2018 - present

### **Department Service**

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Graduate Student Mentor	Spring 2016
Graduate Mathematics Association Webmaster	Spring 2013 - Fall 2014
Graduate Analysis Seminar Organizer	Fall 2015
Teaching Help Desk	Fall 2015
Hiring Committee	Fall 2018
Hiring Committee	Fall 2019
Head of the Masters Program Development Committee	Spring 2018 - present
Seminar Organizer	present
Undergraduate Seminar Organizer	present

### **Grants, Awards and Recognition**

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College of Liberal Arts and Sciences Travel Grant	
Neil White Teaching Award	Spring 2016
Letter of Recognition for Excellence in Teaching	Spring 2017
Provost Professional Development Grant	Summer 2018