

# Syuzanna SARGSYAN

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## OBJECTIVE

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A driven and successful Applied Mathematician who seeks opportunities in industry to apply her strong analytical and problem solving skills for the benefit of a company and to enrich her knowledge.

## RESEARCH SKILLS

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Machine Learning, Optimization  
Dimensionality Reduction, Data Analysis  
Sparse (Compressive) Sensing  
Dynamical Systems

## COMPUTER SKILLS

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Programming Languages: MATLAB, PYTHON, R, C++, SQL  
Operating Systems: MACOSX, WINDOWS, UNIX, LINUX

## WORK EXPERIENCE

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### *Summer Intern at Sandia National Laboratories*

SUMMER 2015

Incorporated reduced order models, finite volume methods and conservation laws from physics to formulate and numerically solve a constrained optimization problem for fluid flows. Used a specific method (LSQ-POD) to solve a challenging constrained nonlinear least square optimization problem nearly as efficiently as unconstrained problem. This helped to reproduce particular characteristics of experimental data that the previous method could not capture.

### *Research Assistant at UNIVERSITY OF WASHINGTON, Seattle*

SPRING 2015  
SUMMER 2014  
SPRING 2014

Developed a new algorithm for sensor placement locations (feature selection) for nonlinear dynamical systems with nonlinear libraries. Used optimization and classification to show advantages of the developed algorithm over existing ones. Used mutations from genetic algorithm to optimize the results and improve the state reconstruction.

### *Teaching Assistant at UNIVERSITY OF WASHINGTON, Seattle*

2011-PRESENT

Teaching quiz sections, grading, helping students during office hours for both graduate and undergraduate courses.

### *Instructor at UNIVERSITY OF WASHINGTON, Seattle*

SUMMER 2013

Introduction to Differential Equations and Applications  
[http://students.washington.edu/ssusie/amath351\\_su13.html](http://students.washington.edu/ssusie/amath351_su13.html)

## EDUCATION

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**Ph.D. in APPLIED MATHEMATICS, University of Washington, Seattle** JULY 2016

Advisor: J. Nathan KUTZ

**Relevant coursework:** Machine Learning (including for Big Data), Natural Language Processing, Design and Analysis of Algorithms, Computer Vision, Statistical Methods in Computer Science, Computational Methods in Data Analysis, Scientific Computing with Python, High Performance Scientific Computing, Finite Volume Methods, Applied Analysis, Applied Linear Algebra

**Master's degree in APPLIED MATHEMATICS, University of Washington, Seattle** JUNE 2012

**Master's degree in MATHEMATICS, Yerevan State University, Armenia** JUNE 2011

Advisor: Armen KAMALYAN

Thesis: PARTIAL INDICES OF A CLASS OF MATRIX-FUNCTIONS

**Bachelor degree in MATHEMATICS, Yerevan State University, Armenia** JUNE 2009

Advisor: Mher MARTIROSYAN

Thesis: A FAST APPROXIMATION BY DIRICHLET POLYNOMIALS

## PUBLICATIONS

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*Nonlinear model reduction for dynamical systems using sparse sensor locations from learned libraries*, S. Sargsyan, S.L. Brunton, J.N. Kutz, Phys. Rev. E, 2015, Sep  
<http://link.aps.org/doi/10.1103/PhysRevE.92.033304>

*Genetic Algorithm for Optimal Sensor Locations*, S. Sargsyan, S.L. Brunton, J.N. Kutz, in preparation.

*Structure-Preserving Nonlinear Model Reduction for Finite-Volume Models of Conservation Laws*, S. Sargsyan, K. Carlberg, in preparation.

## CONFERENCES

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THE TWENTY-NINTH ANNUAL CONFERENCE ON NEURAL INFORMATION PROCESSING SYSTEMS (NIPS)

Montreal, Canada, 2015

WEST COAST ROM WORKSHOP, SANDIA NATIONAL LABORATORIES

Livermore, California, 2015

SIAM CONFERENCE ON APPLICATIONS OF DYNAMICAL SYSTEMS

Snowbird, Utah, 2015

TALK: *Nonlinear Model Reduction and Sparse Sensing with Nonlinear Libraries*

SIAM CONFERENCE ON COMPUTATIONAL SCIENCES AND ENGINEERING

Salt Lake City, Utah, 2015

## AWARDS

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*Armenian General Benevolent Union* 2015, 2014, 2012

Scholarship for graduate students of Armenian decent

*Yerevan State University, Armenia* 2009-2011

Scholarship for graduate students with an outstanding curriculum

*Yerevan State University, Armenia* 2005-2009

Scholarship for undergraduate students with an outstanding curriculum

## LANGUAGES

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ARMENIAN: Native

ENGLISH: Fluent

RUSSIAN: Fluent