Ranil Basnayake

*216 Windy Peak Loop*

*Cary, NC 27519 (315)-262-6685*

[*basnayakeranil80@gmail.com*](mailto:basnayakeranil80@gmail.com)

Education

**University of North Carolina at Charlotte**, Charlotte, NC Data Analytics Boot Camp, February 2023

* Python, SQL, Excel, JavaScript, Tableau and AWS

**Durham Technical Community College**, Durham, NC

Certificate of Information Technology - Software Development Fundamentals, May 2019

Certificate of Information Technology - Java Developer, May 2019

**Clarkson University**, Potsdam, NY Ph.D., Mathematics, December 2014

* Compute optical flow fields of fluid systems from remote sensing imagery and analyze the dynamics of the observed system by developing algorithms in MATLAB

M.S., Mathematics, May 2011

**University of Peradeniya**, Peradeniya, Sri Lanka B.Sc. special degree in Mathematics, July 2005

* Highest GPA in 2005 Mathematics special batch

Research

Experience **Clarkson University**, Potsdam, NY USA

***Research Associate* July 2014 – December 2016**

Funding Agency: National Geospatial - Intelligence Agency

Topics: Developing Bayesian as well as variational based optical flow algorithms for multi-spectral satellite imagery and developing algorithms to remove biased data such as stripes from satellite images.

***Research Assistant* June 2013 – July 2014**

Funding Agency: Office of Naval Research

Topics: Computation of optical flow fields from satellite imagery and analyze dynamics of fluid systems.

***Research Assistant* August 2009 – June 2012**

Funding Agency: Office of Naval Research

Topics: Computation of optical flow fields from satellite imagery and analyze dynamics of fluid systems.

Research Interests

Teaching

Stock Market Analysis and Face Recognition using Machine Learning Techniques.

Experience **Durham Technical Community College**, Durham, NC

***Adjunct Instructor, Mathematics (Online and In-person)* January 2018 – December 2022**

Teach Quantitative Literacy, Precalculus Algebra, Precalculus Trigonometry and Calculus I

Conduct *Maple* lab classes

***Professional Math Tutor* August 2017 – December 2018** Assisted students working on *Pearson MyMathLab* modules at Developmental Math Shell (DMS) Lab addressing their difficulties.

**Devry University**, Raleigh, NC

***Visiting Professor II (Online and In-person)* April 2019 – December 2020**

Teach Statistics for Decision Making - both online and onsite classes.

**Arts of Problem Solving Academy**, Morrisville, NC

***Instructor* August 2018 – March 2019**

Taught Algebra and Geometry for middle school students.

**Clarkson University**, Potsdam, NY

***Teaching Assistant* June 2012 – June 2013**

Recitations Taught: Calculus I, II

**University of Peradeniya**, Peradeniya, Sri Lanka

***Assistant lecturer* July 2007 – July 2009** Courses Taught: Business Mathematics, Probability and Statistics I, Topology, Vector methods and Set Theory.

Developed skills to help promote success among Mathematics and Statistics students using required prior knowledge in advanced Mathematics and Statistics courses.

***Teaching Assistant* July 2005 – June 2007** Recitations Taught: Ordinary Differential Equations, Calculus I, Calculus II and Mathematical Modeling.

Publications

Basnayake, R. and Bollt, E. and Sun, J.,& Tufillaro, N., "Regularization Destriping of Remote Sensing Imagery," *Nonlinear Processes in Geophysics*, Manuscript ID: npg- 2016-74 (2017)

Basnayake, R. and Bollt E., “A Multi-Time Step Method to Compute Optical Flow with

Scientific Priors for Observations of a Fluidic System," *Ergodic Theory, Open Dynamics, and Coherent Structures*, 84(4), 59–79 (2014).

Basnayake, R. and Luttman, A. and Bollt E., “A Lagged Diffusivity Method for Com- puting Total Variation Regularized Fluid Flow," *Contemporary Mathematics*, 586,59-66 (2013).

Luttman, A., Bollt, E., Basnayake, R., Kramer, S., & Tufillaro, N., “A Framework for Estimating Potential Fluid Flow from Digital Imagery,” *Chaos*, 23(3):033134 (2013).

Luttman, A., Bollt, E., Basnayake, R., & Kramer, S. “A Stream Function Approach to Optical Flow with Applications to Fluid Transport Dynamics,” *Proceedings in Applied Mathematics and Mechanics*, 11 1 855 - 856 (2012).

Bollt, E., Luttman, A., Kramer, S., & Basnayake, R. “Measurable Dynamics Analysis of Transport in the Gulf of Mexico During the Oil Spill,” *Int. J. of Bifurcation and Chaos*, 22(3):1230012 (2012).

Research

Presentations **A Simple approach of Destriping Remote Sensing Imagery:** *Dynamics Days 2017:* Silver Spring, MD January 04-06 2017

**Remote Sensing Image Destriping by Optimizing an Inverse Problem:** *SAMSI Optimization Program Summer School:* Durham, NC August 08-12 2016

# Destriping of Remote Sensing Imagery by Optimizing an Inverse Problem:

*SIAM Annual Meeting (AN16):* Boston, MA July 11-15 2016

**Variational Destriping on Remote Sensing Imagery:** *Workshop on Nonlinear Processes in Oceanic and Atmospheric Flows:* Madrid, Spain July 6-8 2016

**Analysis of Spatiotemporal Dynamical Systems from Multi-Attribute Satel- lite Images:** *SIAM Conference on Applications of Dynamical Systems:* Snowbird, UT May 17-21 2015

**Analysis of Geospatial Fluid Systems from Satellite Imagery:** *4th New York Conference on Applied Mathematics. C*ornell University, Ithaca, NY, November 9 2013

**Analysis of Dynamics in Fluid Systems from the Optical Flow Vector Fields** *SIAM Conference on Applications of Dynamical Systems:* Snowbird, UT May 19-23 2013

# Analysis of Fluid Systems from the Optical Flow-Approximate Vector Fields:

*Dynamics Days 2013.* University of Colorado at Boulder, Denver, CO January 3-6 2013

**Regularization of Optical Methods for Computing Flow Dynamics:** *2012 Joint Mathematics Meetings.* Hynes Convention Center, Boston, MA January 4 - 7 2012

**Optical Flow to Analyze Dynamics in Fluids:** *4th Annual St. Lawrence Valley Mathematics Symposium.* Clarkson University, Potsdam, NY, October 28-29 2011

**Comparison of Numerical Techniques in Optical Flow Computation:** *2nd New York Conference on Applied Mathematics.* University at Buffalo, Buffalo, NY April 30 2011

# Flow Fields Inferred from Time Dependent Data Sets and Parameter Estimation: *Dynamics Days 2010.* Northwestern University, Evanston, IL, January 4-7, 2010

**An Efficient Algorithm to Solve a Large-Scale Balanced Transportation Problem:** *Peradeniya University Research Sessions (PURSE) 2007.* University of Peradeniya, Peradeniya, Sri Lanka, July 2007

Skills

* *Python, JavaScript, SQL, Tableau, MATLAB, Excel, JAVA, HTML & CSS and AWS*
* Machine Learning
* Neural Network

Awards

*Montana Uncertainty Quantification Workshop 2015 Travel Award,* Missoula, MT 2015

*Best Poster Award for “Remote-Attribute Spatiotemporal Dynamical Systems Analysis”, 2014 NGA Academic Research Program Symposium,* Washington, D.C. 2014

*Dynamics Days 2013 Travel Award,* Denver, CO 2013

*Full Financial Award for the Three-Week IAS/PCMI Research Summer School,* Park city, UT 2010

*Dynamics Days 2010 Travel Award,* Evanston, IL 2010

Residency

Status *US Permanent Resident*