JITHIN D. GEORGE

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EDUCATION

2016-2018 **M.S., Applied Mathematics**, *University of Washington*.
Thesis: "Green's Law and the Riemann Problem in Layered Media" Adviser: Randall J. LeVeque.
G.P.A : 3.74/4.00

2011-2015 **B.E.(Hons.), Mechanical Engineering**, *BITS-Pilani*.
G.P.A: 8.11/10.00 (Major G.P.A: 8.36/10.00)

RESEARCH EXPERIENCE

Summer 2017 **Visiting Scholar**, *International Centre for Theoretical Sciences - TIFR*.
- Worked with Dr. Vishal Vasan on a spectral toolbox for solving partial differential equations and boundary value problems using their integral forms and on various domains, like on the real line using rational Chebyshev functions.

2015- 2016 **NPOL Project Assistant**, *Tata Institute of Fundamental Research- Centre for Applicable Mathematics*.
- Worked on 3-D tomographic algorithms for synthetic aperture sonar under Dr. Venky Krishnan and Dr. A.S. Vasudeva Murthy for the Naval Physical and Oceanic Laboratory (NPOL).
- Worked with Dr. Praveen Chandrashekar on well-balanced schemes for Euler equations with gravity (describing various gas dynamics).

WORK EXPERIENCE

2016-2018 **Graduate Teaching Assistant**, *University of Washington*.
Worked as a Teaching Assistant for
- AMATH 351 - Differential Equations
- PHY 121 - Mechanics Laboratory
- AMATH 301 - Beginning Scientific Computing
- STAT 311 - Essentials of Statistical Methods

June - Dec 2014 **Noise, Vibration and Harshness Team**, *Altair Engineering*.
- Created Build Verification Tests for Altair's Noise Vibration and Harshness Director.
- Created post-processing utilities for Altair's HyperView.

Summer 2013 **Summer Intern**, *Madras Atomic Power Station*
- Worked on the analysis of piston ring failure in compressors using 10 years of data and setup a framework for early warning systems for preventive maintenance.

PUBLICATIONS AND PROCEEDINGS

1. "Revisiting the inhomogeneously driven sine-Gordon equation." Ameya D. Jagtap, Esha Saha, Jithin D. George and A.S. Vasudeva Murthy. **Wave Motion, Elsevier**.
https://doi.org/10.1016/j.wavemoti.2017.05.003

2. "Fault Size Estimation Using Vibration Signatures in a Wind Turbine Test-rig." Sailendu Biswal, Jithin Donny George, and G. R. Sabareesh. **Procedia Engineering, Elsevier**.
https://doi.org/10.1016/j.proeng.2016.05.137.

3. "Numerical study on displacement of dielectric film composed of array of differently shaped elements for capacitance based MEMS sensors." Ashish Saxena and Jithin Donny George. **IEEE-2016 International Conference on Microelectronics, Computing and Communications (MicroCom)..**
https://doi.org/10.1109/MicroCom.2016.7522489.

1. "A visual way to teach the FFT", Jithin D. George, To appear. **SIAM News** (Sept 2018)

2. "Shoaling on steep continental slopes: From the Riemann problem to Green's law." Jithin D. George, David I. Ketcheson and Randall J. LeVeque.

3. "Approximate solutions in the context of wave propagation in non-homogeneous media" Jithin D. George, David I. Ketcheson and Randall J. LeVeque.

AWARDS

- Joseph Hammack Endowment Award for exemplary work by a student in the Department of Applied Mathematics.
- Indian High Commissioner's Gold Medal from the Indian Ambassador to Tanzania.
- Merit-Cum-Need Scholarship throughout undergraduate study at BITS-Pilani.
- Silver medal in general knowledge in the NCERT National Talent Search Examination
- Silver medal in mathematics in the NCERT National Talent Search Examination.

RESEARCH PROJECTS

- **Estimating speech from lip dynamics** (with Ronan Keane and Conor Zellmer) *UW (AMATH 582), Winter 2017*.
  We developed a limited lip-reading algorithm for a subset of the English language (https://arxiv.org/abs/1708.01198). The position of the lips in each frame of a video is extracted using techniques like active contours. The lip data is then classified into visemes(or phonemes) and Hidden Markov Models are used to predict the speaker's words using the sequences of classified visemes.
- **Gene expression exploration through fMRI data analysis** (with Dr. Nina De Lacy) *Seattle Children's Hospital, 2016*.
  The Allen Insitute has a lot of open data on the effects of various genes on certain brain structures. This data is used to construct an inverse map between an fMRI scan and the genes responsible for it. Hopefully, this will help in the study of genes responsible for neurological diseases.
- **Simulating the sine-Gordon wave to understand earthquakes** *TIFR-CAM, 2016*.
  The sine-Gordon wave is of relevance in the study of seismic events. Although the homogeneous equation has soliton solutions, it is difficult to obtain an exact solution with external forcing. So, we numerically simulate kink and breather test cases under various boundary conditions to see the changes in soliton behaviour.
- **Condition monitoring of a wind turbine test rig and fault prediction**(with S. Biswal and G. Sabareesh) *BITS-Pilani, 2015*.
  From the vibration data of a wind turbine test rig, selected features were extracted based on skewness, kurtosis and techniques like wavelet analysis. These features were used as inputs in neural networks to predict fault in the bearings.
- **Design of a novel wall-climbing robot** *BITS-Pilani, 2013*.
  A novel design of a wall-climbing robot, with mechanisms for both flipping and turning, was developed and then visualised in SolidWorks. This project was later put on Quirky, a website for crowdfunding inventions, and got voted into Expert Review.
- **Development of an image processing prototype called "Lazy Mouse"** *MIT Media Lab Design Innovation Workshop, 2014*.
  At the 4th Design Innovation Workshop organized by the MIT Media Lab, I worked on a image processing prototype which used a webcam to track a dot on the wall and capture its movements and color changes to control my mouse and its clicks, allowing me to control my laptop using a laser pointer.
- **Modeling and simulation of a prosthetic socket** (with Dr.S.P Regalla) *BITS-Pilani, 2014*.
  My work involved the creation of a prosthetic socket in Creo(ProE) and the simulation of variational pressure on the pain resistant regions to obtain the ideal socket displacement. This was one of the pioneer projects in the development of a startup in BITS's incubator for the 3D printing of prosthesis at affordable prices.

SERVICE TO VARIOUS COMMUNITIES

- **Scio Foundation** (2012 – 2015). Served as Editor-In-Chief, writing articles and organizing events to expose indian high schoolers to various careers and the paths to reach them.
- **SIAM Chapter at UW** (2016–). Volunteer for events like Math Fair where we travel to a local school and engage the students in math and critical-thinking activities.
- **Open-source Software**. Contributed code, raised issues and reported bugs for Sympy and Clawpack.

INTERESTS

- Scientific Computing, Perturbation Theory, Dimensionality Reduction, Dynamical Systems, Calculus of Variations and Random Processes.

Skills

Programming   **Software**

Python ● Matlab ● Fortran ● C ● R ● TCL ● LaTeX ●   HyperWorks● COMSOL ● Creo ● SPSS ● CATIA ●