Niranjana Kulkarni

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EDUCATION

Texas A&M University   College Station, TX
Masters in Applied Mathematics: Computational Math   *January 2023 - December 2024*

University of California, Davis   Davis, CA
Bachelor of Science in Applied Mathematics   *June 2020 - June 2022*

Relevant Masters Coursework
Texas A&M GPA: 3.7/4.0

Methods and Applications of Partial Differential Equations, Numerical Methods in Differential Equations, Numerical Analysis, Directed Studies Course:"Existence and Stability Properties of Solitary Waves and Related PDE Theory", Statistical Computing with R and Python, Regression Analysis, Statistical Computations, Introduction to Ordinary and Partial Differential Equations, Mathematical Modeling, Introduction to Classical Analysis

Relevant Undergraduate Coursework
UC GPA: 3.79/4.0

Ordinary Differential Equations, Complex Analysis, Modern Algebra, Numerical Analysis, Combinatorics, Real Analysis, Probability, Statistics, Optimization, Data Structures, Engineering Problem Solving, Linear Algebra, Abstract Mathematics, Principles of Microeconomics and Macroeconomics, Facilitating Learning in STEM

TECHNICAL SKILLS

Programming Languages: Python, R, MATLAB, AMPL, LaTeX, JavaScript
Tools: Jupyter Notebook, RStudio, PyCharm, Pixlr, Excel, MS Paint 3D, MS Video Editor, MS Word, MS PowerPoint, MS OneNote, MS Access, Google Workspace, Weebly, Google Sites
Libraries: pandas, numpy, scipy, matplotlib, Tkinter, urllib, socket

PROJECTS & EXPERIENCE

Thesis | *Advisor: Dr. Andrew Comech, Texas A&M*   Jan 2024 - Oct 2024
- Titled as "**On The Radial Reduction of the Linearization at a Solitary Wave in the Nonlinear Dirac Equation in Three Spatial Dimensions**".

PDEs Learning Seminar | *led by Dr. Andrew Comech & Dr. Dean Baskin, Texas A&M*   Aug 2024 - Present
- **Presented a 45 minute talk of my research** on the Nonlinear Dirac Equation and answered questions.
- Attended weekly talks presenting current research work in PDE theory.

Research | *with Dr. Andrew Comech, Texas A&M*   Jan 2024 - Present
- Researched **one-frequency and bi-frequency solitary waves** in the Nonlinear Dirac Equation.
- Learned about spectral stability of solitary waves.
- Started learning about spectral theory of differential operators.
- Studied relevant applications of differential equations to quantum mechanics and physical processes.

Article (In Progress) | *with Dr. Andrew Comech, Texas A&M*   Jan 2024 - Present
- Titled as "**Stable bi-frequency spinor modes as Dark Matter candidates**".

Article (In Progress) | *with Dr. Andrew Comech, Texas A&M*   Jan 2024 - Present
- Titled as "**On spectral stability of one- and bi-frequency solitary waves in Soler model in (3+1)D**".

Graduate Student Assistant Grader | *Texas A&M*   Aug 2023 - Dec 2023
- Graded homeworks for all sections of two courses: Complex Analysis and Combinatorics.

Mathematics and Statistics Fair Volunteer | *Texas A&M*   Apr 15, 2023
- Prepared teaching materials, teaching plan, example problems, and worked one-on-one with visiting high school students to help them reach deeper understanding of the topics.

Independent Reading Course in Knot Theory | *with Dr. Jennifer Schultens, UC Davis*   Jun 2022 - Sep 2022
- Studied Knot Theory and its applications.

Application of Computers in Technology Intern | *PLS 21, UC Davis*   Jan 2022 - Jun 2022
- **Taught elementary statistics in R, data visualizations in Excel, Microsoft Access, Pixlr, Google Workspace, Weebly, and other software applications to 100+ undergraduate students** during office hours and lab sessions in both virtual and in-person settings.
- Developed curriculum and created a lesson plan for over 300 students with head teaching faculty.
- **Graded** the work of more than 40 students per week and gave them **meaningful feedback**.
- Created lesson plan using Google Sites, **leader in facilitating team communications** of this project.

Discord Server Academic Administrator - 15+ Classes | *Self-Taught*   Jun 2020 - Jun 2022
- Moderated student interaction, resolved conflicts and implemented student server suggestions.
- Utilized server bot capabilities to fit the needs of students.

AmongUs Inspired Card Game Project | *MATLAB, App Designer, ThingSpeak IoT*   Oct 2020 – Dec 2020
- Created key aspects of the game mechanics, UX/UI elements using **MATLAB App Designer**; created images of all aspects of the game as well as edited images from the original game to suit our group's needs as the Main Graphic Designer and Programmer.
- Ensured that **ThingSpeak IoT** was working properly to get data from player to player on different computers in real time.
- Tested, debugged, and modified code to improve code efficiency.

Teacher Assistant for AP Statistics | *Wilcox High School*   Jan 2018 - Mar 2020
- Graded assignments for up to 30 students per week.
- Assisted the instructor with new course material to ensure that students gained a deeper understanding of Statistics.
- Clarified difficulties in material and homework problems that students had, answered questions about statistical methods and TI-84 graphing calculator functions.

California Scholarship Federation Volunteer | *Wilcox High School*   Jan 2017 - Dec 2019
- Served and prepared various food dishes for over 2,000 students.
- Supervised younger volunteers in food distribution and hygienic practices.
- Organized with other volunteers to serve food at an efficient pace.