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# D Bhanu Prakash

PhD Student, Mathematics

*I am a second year PhD student in Mathematics working on the stochastic optimal control problems for prey-predator systems and apply these results to biological conservation and pest management.*

## Current Appointment

October 2021– **Junior Research Fellow(JRF)**

Project title: *Time - Optimal Control Studies and Bifurcation Analysis of Coupled Non-Linear Dynamical Systems with Application to Pest Management* under the supervision of Dr. Krishna kiran Vamsi Dasu. This work is being funded by National Board of Higher Mathematics, DAE, Government of India.

## Areas of Specialization

- Mathematical Ecology: Prey-Predator Dynamics
- Mathematical Epidemiology: Disease Modeling
- Optimal Control Theory - Deterministic and Stochastic
- Dynamical Systems
- Bifurcation Analysis

## Education

- 2018–2020 **Sri Sathya Sai Institute of Higher Learning**, M.Sc., Mathematics specialization in Computer Science, *GPA:8.3/10*
- 2015–2018 **Sri Sathya Sai Institute of Higher Learning**, B.Sc., Mathematics(Hons.) specialization in Computer Science, *GPA:7.5/10*
- 2013–2015 **Sri Chaitanya Junior College**, Intermediate, Mathematics, Physics, Chemistry, *Score:975/1000*
- 2012–2013 **Sree Balajee Vidyalayam**, S.S.C. , *GPA:9.7/10*

## Experience

- 2020–2021 **Research Assistant**, Sri Sathya Sai Institute of Higher Learning, Doing Literature Review , on *Stochastic Modeling, Optimal Control Theory and Bayesian Statistics*

## Publications

Accepted

- 2022 **D. B. Prakash** and D. K. K. Vamsi, "Stochastic time-optimal control studies for additional food provided prey-predator systems involving holling type-iv functional response," *arXiv preprint arXiv:2212.06447*, 2022. [Online]. Available: <https://arxiv.org/abs/2212.06447v1> - Accepted in [Frontiers in Applied Mathematics and Statistics](#)

Journal Articles

- 2023 **D. B. Prakash** and D. K. K. Vamsi, "Stochastic optimal and time-optimal control studies for additional food provided prey–predator systems involving holling type iii functional response," *Computational and Mathematical Biophysics*, vol. 11, no. 1, p. 20220144, 2023. [Online]. Available: <https://doi.org/10.1515/cmb-2022-0144>
- 2022 B. Chhetri, D. K. K. Vamsi, **D. B. Prakash**, S. Balasubramanian, and C. B. Sanjeevi, "Age structured mathematical modeling studies on covid-19 with respect to combined vaccination and medical treatment strategies," *Computational and Mathematical Biophysics*, vol. 10, no. 1, pp. 281–303, 2022. [Online]. Available: <https://doi.org/10.1515/cmb-2022-0143>
- 2022 B. Chhetri, V. M. Bhagat, D. K. K. Vamsi, V. S. Ananth, **D. B. Prakash**, S. Muthusamy, P. Deshmukh, and C. B. Sanjeevi, "Optimal drug regimen and combined drug therapy and its efficacy in the treatment of covid-19: A within-host modeling study," *Acta Biotheoretica*, vol. 70, no. 2, pp. 1–28, 2022. [Online]. Available: <https://doi.org/10.1007/s10441-022-09440-8>
- 2022 D. S. S. M. Kanumoori, **D. B. Prakash**, D. K. K. Vamsi, and C. B. Sanjeevi, "A study of within-host dynamics of dengue infection incorporating both humoral and cellular response with a time delay for production of antibodies," *Computational and Mathematical Biophysics*, vol. 9, no. 1, pp. 66–80, 2021. [Online]. Available: <https://doi.org/10.1515/cmb-2020-0118>
- 2021 **D. B. Prakash**, B. Chhetri, D. K. K. Vamsi, S. Balasubramanian, and C. B. Sanjeevi, "Low temperatures or high isolation delay increases the average covid-19 infections in india: A mathematical modeling approach," *Computational and Mathematical Biophysics*, vol. 9, no. 1, pp. 146–174, 2021. [Online]. Available: <https://doi.org/10.1515/cmb-2020-0122>
- 2021 B. Chhetri, D. K. K. Vamsi, **D. B. Prakash**, and C. B. Sanjeevi, "Combined drug interventions and its efficacy in the reduction of covid-19 burden: A within-host modeling study with reference to hcq and bcg vaccination," *Advances in Dynamical Systems and Applications (ADSA)*, vol. 16, no. 1, pp. 369–403, 2021 [Link](#)
- 2021 B. Chhetri, V. M. Bhagat, D. K. K. Vamsi, V. S. Ananth, **D. B. Prakash**, R. Mandale, S. Muthusamy, and C. B. Sanjeevi, "Within-host mathematical modeling on crucial inflammatory mediators and drug interventions in covid-19 identifies combination therapy to be most effective and optimal," *Alexandria Engineering Journal*, vol. 60, no. 2, pp. 2491–2512, 2021. [Online]. Available: <https://doi.org/10.1016/j.aej.2020.12.011>
- 2020 **D. B. Prakash**, D. K. K. Vamsi, D. B. Rajesh, and C. B. Sanjeevi, "Control intervention strategies for within-host, between-host and their efficacy in the treatment, spread of covid-19: A multi scale modeling approach," *Computational and Mathematical Biophysics*, vol. 8, no. 1, pp. 198–210, 2020. [Online]. Available: <https://doi.org/10.1515/cmb-2020-0111>

## Teaching

Assisted in teaching the following courses

- Mathematical Modeling      ○ Optimal Control Theory      ○ Bayesian Statistics
- Bayesian Statistics      ○ Probability and Statistics

## Workshops/Conferences

### Talks

- [1] **International Conference on Differential Equations and Control Problems (ICDECP23)**, organized by School of Mathematics and Statistical Sciences, Indian Institute of Technology Mandi (IIT Mandi), during June 15-17,2023. [Certificate](#)

### Participation

- [1] **International Workshop on Modeling Dynamics, Statistical Inference and Prediction of Infectious diseases (MoDSIP-2018)**, held at Sri Sathya Sai Institute of Higher Learning (SSSIHL), during August 12-15,2018.

- [2] **National Workshop on Stochastic Differential Equations & Applications**, conducted by Department of Mathematics, Periyar University, Salem, during March 10-13,2021.
- [3] **Indo-US Conference-II on the Science of Mathematical Modeling and Decision Making**, held at Sri Sathya Sai Institute of Higher Learning (SSSIHL), during October 28-30,2021.
- [4] **Third National Conference on Control and Inverse Problems**, jointly organized by Central University of Kerala, Central University of Tamilnadu and Periyar University, during February 25-26,2022.
- [5] **Workshop on Nonlinear Phenomena in Mathematical Biology (WoNPMB-2022)**, held online at Department of Applied Sciences, ABV- Indian Institute of Information Technology and Management (IIITM), Gwalior, during December 19-23,2022.

## Achievements






- [1] APSET 2021 - **Qualified**
- [2] AP EAMCET 2015 - **Rank 1939**
- [3] TS EAMCET 2015 - **Rank 2048**
- [4] IIT JEE Main 2015 - **Rank 17003**









## Certifications

- [1] **Stochastic Processes** by HSE University and offered through **Coursera** - [Certificate](#)
- [2] **Understanding Research Methods** by University of London and offered through **Coursera** - [Certificate](#)

## Skill matrix

Skill matrix Alternatively, provide a skill matrix to show off your skills

	basic knowledge		extensive project experience
	intermediate knowledge with some project experience		deepened expert knowledge
			expert / specialist

	Level	Skill	Years	Comment
Coding:		Python	2	<i>I have been simulating control systems in Python.</i>
		C, C++	5	<i>I have been coding various programs in C, C++ from my undergraduate days.</i>
Applications:		L <sup>A</sup> T <sub>E</sub> X	4	<i>I typed my research papers, presentations and this CV in L<sup>A</sup>T<sub>E</sub>X</i>
		Microsoft Office	2	<i>I am comfortable using MS Office suite.</i>
OS:		Linux	5	<i>I have been using Ubuntu in Desktop.</i>
		Windows	2	<i>I am comfortable using a Windows OS.</i>
Languages:		Telugu	15	<i>Telugu is my mother tongue.</i>
		English	10	<i>I am efficient in vocal, written communication in English.</i>

## Personal Data

Nationality Indian  
Sex Male

Marital    Un-Married  
Status

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## References

- [1] Dr. Krishna Kiran Vamsi Dasu (Ph.D. Advisor) , Associate Professor - Stage I, Department of Mathematics and Computer Science, Sri Sathya Sai Institute of Higher Learning, Prasanthi Nilayam, [dkkvamsi@sssihl.edu.in](mailto:dkkvamsi@sssihl.edu.in)
- [2] Prof. Pallav Kumar Baruah, Professor, Department of Mathematics and Computer Science, Sri Sathya Sai Institute of Higher Learning, Prasanthi Nilayam, [pkbaruah@sssihl.edu.in](mailto:pkbaruah@sssihl.edu.in)