Raghav Gnanasambandam

PHD CANDIDATE · ISE

Virginia Tech, Blacksburg, VA

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Education

Virginia Tech   *Blacksburg, VA*

PHD IN INDUSTRIAL AND SYSTEMS ENGINEERING   *Aug 2019 - May 2024 (expected)*

- Manufacturing Systems Engineering Track
- Advisor: Dr. Zhenyu (James) Kong
- Thesis: "Bayesian and Physics Informed modeling of Additive Manufacturing Process"

IIT Madras   *Chennai, India*

DUAL DEGREE (B.TECH & M.TECH) IN MECHANICAL ENGINEERING   *Aug 2014 - May 2019*

- Specialization: Intelligent Manufacturing
- Minor: Material Sciences
- Thesis: "Machine Vision Based Surface Characterization and Roughness Prediction of Machined Surfaces"

Awards & Honors

2022	**Winner**, INFORMS 17th DMDA Workshop Poster Competition	*$ 500*
2022	**Finalist**, INFORMS QSR Data Challenge	
2022	**Winner**, IISE QCRE-Process Miner Industrial Data Challenge	*$ 2,000*
2022	**Travel Awards**, ISE at Virginia Tech	*∼ $ 1,200*
2022	**Member**, Graduate Academy for Teaching Excellence (GrATE), Virginia Tech	
2019-2020	**Graduate Fellowship**, ISE at Virginia Tech	
2014-2019	**Undergraduate Scholarship**, NLC India Ltd.	
2014	**Scholarship for Higher Education (SHE)**, Govt. of India	

Publications

PUBLISHED

Bo Shen, **Raghav Gnanasambandam**, Rongxuan Wang, Zhenyu (James) Kong. 2022. Multi-task Gaussian process upper confidence bound for hyperparameter tuning and its application for simulation studies of additive manufacturing. *IISE Transactions*, DOI: 10.1080/24725854.2022.2039813.

Akhil V, **Raghav Gnanasambandam**, N Arunachalam, DS Srinivas. 2020. Image data-based surface texture characterization and prediction using machine learning approaches for additive manufacturing. *Journal of Computing and Information Science in Engineering* 20 (2), 021010.

Akhil V, N Arunachalam, **Raghav Gnanasambandam**, DS Srinivas. 2020. Surface texture characterization of selective laser melted Ti-6Al-4V components using fractal dimension and lacunarity analysis. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*. November 2020. doi:10.1177/0954405420971081 .

IN REVIEW

Raghav Gnanasambandam, Bo Shen, Andrew Chung Chee Law, Zhenyu (James) Kong. Deep Gaussian Process Upper Confidence Bound for Optimizing Non-Stationary Functions and its Application in Additive Manufacturing. *IISE Transactions*. 2022. First round of Revision.

Raghav Gnanasambandam, Bo Shen, Jihoon Chung, Xubo Yue, Zhenyu (James) Kong. Self-scalable Tanh (Stan): Accelerated Convergence and Better Generalization of Physics-informed Neural Networks. arXiv preprint arXiv:2204.12589 (2022). Submitted to *IEEE Transactions on Pattern Analysis and Machine Intelligence*.

- **Winner** of IISE QCRE-Process Miner Industrial Data Challenge 2022.

- **Winner** of 17th INFORMS DMDA Workshop Poster Competition 2022.

Presentations

TALKS

October 2022. *Self-scalable Tanh (Stan): Faster Convergence and Better Generalization in Physics-informed Neural Networks*. **17th Data Mining and Decision Analytics Workshop, Indianapolis, IN.**

October 2022. *Deep Gaussian Process Upper Confidence Bound for Optimizing Non-stationary Functions and Its Application in Additive Manufacturing*. **Invited Talk: INFORMS Annual Meeting, Indianapolis, IN.**

October 2022. *Physics-informed Machine Learning for Additive Manufacturing*. **Invited Talk: INFORMS Annual Meeting, Indianapolis, IN.**

May 2022. *Physics Informed Neural Networks for Additive Manufacturing*. **Invited Talk: IISE Annual Meeting, Seattle, WA.**

October 2021. *Bayesian Optimization for Additive Manufacturing*. **Invited talk: INFORMS Annual Meeting, Anaheim, CA.**

March 2019. *Automatic Gear Shifting Strategy*. **Invited Talk: AI in Manufacturing Course, IIT Madras, India.**

POSTERS

Self-scalable Tanh (Stan) activation for Physics-informed Neural Networks.

- October 2022, 17th DMDA Workshop, Indianapolis, IN. **(Winner)**
- October 2022, INFORMS QSR Poster Session, Indianapolis, IN.
- May 2022, IISE-QCRE Student Interaction and Poster Session, Seattle, WA.

Teaching Experience

Spring '21	**ISE 3004 Industrial Cost Control**, Graduate Teaching Assistant	*Virginia Tech*
Fall '19 & Fall '20	**ISE 3214 Facilities & Logistics**, Graduate Teaching Assistant	*Virginia Tech*
Spring '20	**ISE 2214 Manufacturing Processes Lab**, Lab Instructor	*Virginia Tech*
Spring '19	**ME 2400 Measurement, Instrumentation and Control**, Teaching Assistant	*IIT Madras*
Fall '18	**ME 2050 Machine Drawing Practice**, Lab Instructor	*IIT Madras*

Professional Experience

RF Wave Technologies Pvt. Ltd. *Chennai, India*
SUMMER INTERN *2017*
- Designed a sensor system for data logging and control of farm robot.
- Validated the mechanical design and conceptualized a power system for the robot.

IIT Madras & Prisms India Pvt. Ltd. *Chennai & Pondicherry, India*
PROJECT *2017*
- Automated the straightness measurement in an Autocollimator with a vision system.
- Designed the setup and developed a software UI to take automated readings.

Service

2022-2023	**Graduate Student Ambassador**, Graduate School	*Virginia Tech*
2021-2022	**Graduate Student Mentor**, ISE Department	*Virginia Tech*
2022	**Research Poster Judge**, Undergraduate Poster Competition	*Virginia Tech*
2021	**Student Volunteer**, ISE Senior Symposium	*Virginia Tech*
2020-2021	**Secretary**, Society of Manufacturing Engineers	*Virginia Tech*

Professional Memberships

Institute of Industrial and Systems Engineers (IISE).
Institute for Operations Research and the Management Sciences (INFORMS).

Peer Review

IEEE Transactions on Automation Science and Engineering