

# Rakesh Sharma

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## Research Interests

My research interests lie in biomedical signal processing including image reconstruction, image analysis, and applications of AI in diagnostics and therapeutics.

## Employment History

- 2024 – Curr     ■ **Advisor - Data Science**, Eli Lilly and Company, Bengaluru.  
Area of work: Injection Physiology, CBCT reconstruction, Bio-informatics.  
Tools used: *Python, OpenCV, HPC, R, Tensorflow, PyTorch, Scikit-learn, Pillow*.
- 2023 – 2024     ■ **Senior Manager - Data Science**, Eli Lilly and Company, Bengaluru.  
Area of work: Injection Physiology, CBCT reconstruction, Bio-informatics.  
Tools used: *Python, OpenCV, HPC, R, Tensorflow, PyTorch, Scikit-learn, Pillow*.
- 2020 – 2023     ■ **Manager - Data Science**, Eli Lilly and Company, Bengaluru.  
Area of work: Medical image analysis, CBCT reconstruction, Process automation.  
Tools used: *Python, OpenCV, Slicer3D, HPC, R, Tensorflow, PyTorch, Scikit-learn, Pillow*.
- 2018 – 2020     ■ **CTO and Co-founder**, Comofi Medtech Private Limited, Bengaluru.  
Area of work: Medical image analysis, Image Registration, Robotics.  
Tools used: *Python, OpenCV, Tensorflow, ROS, Slicer3D, Scipy, Numpy*.
- 2017 – 2018     ■ **Lead - Product Development**, Achira labs Private Limited, Bengaluru.  
Area of work: Immunoassay development, Data analysis and visualization.  
Wet Lab exp: *Fluorescence imaging, Microfluidics, Medical product development*.
- 2015 – 2017     ■ **Scientist**, Achira labs Private Limited, Bengaluru.  
Area of work: Immunoassay development, Microfluidics.  
Wet Lab exp: *Fluorescence imaging, Microfluidics, Biosensor development*.
- 2013 – 2015     ■ **Project Engineer (Star Batch)**. Wipro Technologies, Bengaluru.  
Area of work: Computer Vision, Android Development.  
Tools used: *Java, Python, C, OpenCV*.

## Education

- 2008 – 2013     ■ **M.Tech. Biomedical Technology, Indian Institute of Technology (BHU), Varanasi**  
Dissertation title: *Synthesis and characterization of nano-composites of graphene and f-graphene with Bone-Cement*.
- **B.Tech. Bioengineering, Indian Institute of Technology (BHU), Varanasi**  
Thesis title: *Fabrication and validation of Low-cost pressure sensor embedded contact lens*.

## Certification

- 2021 – 2022
- **Artificial Intelligence Professional Program.** Awarded by Stanford University.  
XCS229- Machine Learning,  
XCS221- Artificial Intelligence: Principles and Techniques,  
XCS224W- Machine Learning with Graphs.

## Patent Publications

### Published Patent Applications

- 1 H. Desai, M. Kawiecki, **R. Sharma**, A. Tiwari, and J. Venderley, *WO2023044089A1 - Methods and apparatuses for detecting anomalies when filling a container with fluid*, US Patent App. PCT/US2022/043937, Mar. 2023.
- 2 K. Gururaj, S. Kalme, S. Raghunath, and **R. Sharma**, *System for renal puncturing assistance*, US Patent App. 17/294,009, Jan. 2022.
- 3 **R. Sharma** and M. Madhusudhanan, *Image processing method of enabling financial transaction and an image processing system thereof*, US Patent App. 14/459,428, Dec. 2015.

## Research Publications

### Journal Articles

- 1 X. Dang, H. Shih, **R. Sharma**, et al., "Clinical investigations of large volume subcutaneous delivery up to 25ml for lean and non-lean subjects," *Under review*, 2023.
- 2 S. Goyal, P. Bist, and **R. Sharma**, "Optimal sample pooling: An efficient tool against sars-cov-2," *medRxiv*, 2020.
- 3 **R. Sharma**, G. Kapusetti, S. Y. Bhong, et al., "Osteoconductive amine-functionalized graphene–poly (methyl methacrylate) bone cement composite with controlled exothermic polymerization," *Bioconjugate chemistry*, vol. 28, no. 9, pp. 2254–2265, 2017.

Two articles in draft stage.

### Conference Proceedings

- 1 J. Pai, M. Azad, B. Goyal, R. Nair, **R. Sharma**, and D. Dendukuri, "A point-of-care immunoassay platform for thyroid function based on hydrogel sensors embedded inside a microfluidic device," in *23rd International Conference on Miniaturized Systems for Chemistry and Life Sciences, MicroTAS 2019*, Chemical and Biological Microsystems Society, 2019, pp. 102–103.

## Invited Talk

- 2019
- **36th Annual Seminar And 20th Triguna Sen Memorial Lecture "The Artificial Intelligence Revolution, Are You Ready?**  
*Indian Institute Of Chemical Engineers, New Delhi.*

## Skills

- Coding
- Python, R, C, Java, Lua

## Skills (continued)

- |                     |  |
|---------------------|--|
| Libraries and Tools | ■ OpenCV, Numpy, Scipy, Tensorflow, PyTorch, Scikit-Learn, Pillow, Slicer3D, PyQt, Tkinter |
| Languages           | ■ Strong reading, writing and speaking competencies for English, Hindi and Nepali.         |

## Awards and Achievements

- |         |   |
|---------|---|
| H2,2023 | ■ <b>Lilly Innovator Award (Individual and Team)</b> , Lilly Research Labs            |
| H1,2022 | ■ <b>Lilly Innovator Award</b> , Lilly Research Labs                                  |
| Q4,2021 | ■ <b>Lilly Innovator Award</b> , Lilly Research Labs                                  |
| 2014    | ■ <b>Top 6 coders</b> , hackathon among ~ 0.15million Wipro employees                 |
| 2013    | ■ <b>2<sup>nd</sup> Rank</b> , Undergraduate and Master's Degree                      |
| 2008    | ■ <b>Top 1.56%</b> , among 0.32million Indian students appearing in IIT entrance exam |

## References

### Prof Neeraj Sharma

Professor  
School of Bio-Medical Engineering,  
Indian Institute of Technology (BHU), Varanasi,  
Uttar Pradesh, India 221005  
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### Galen H Shi, Ph.D.

Vice President - Engineering,  
Delivery, Devices and Connected Solutions  
Eli Lilly & Company  
Indianapolis, IN 46221 USA  
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### Xiangnan Dang, Ph.D.

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