

# Nitin Jayakumar

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## Professional Experience

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### Post-Doctoral Research Scientist –

June 2024 – June 2025

Department of Biochemistry and Molecular Genetics

#### University of Illinois at Chicago

- Led the development of an automated, miniature robotic air sampling platform for the real-time detection of airborne viruses in all aspects of prototyping - including metal fabrication, electrical and mechanical design, software development.
- Awarded the Illinois Innovation Voucher Program – 2025 for the development of this work

### Technology Commercialization Analyst –

July 2017 – May 2024

Office of Technology Management

#### University of Illinois at Chicago

- Analysis of research discoveries and university technology findings for commercialization potential and intellectual property protections
- Technical synthesis and communication between university faculty, researchers and commercialization partners

## Education

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### Doctor of Philosophy (PhD) – Mechanical Engineering

Aug 2016 – May 2024

#### University of Illinois at Chicago

### Bachelor of Engineering (B.E) – Electronics/Electrical Engineering

*First Class with Distinction*

#### Visvesvaraya Technological University, Karnataka, India

Sept 2010 – Jun 2014

## Research Experience

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### Graduate Researcher –

Oct 2017 – May 2024

Micro-Mechatronic Systems Laboratory

#### Electrical and Computer Engineering

#### University of Illinois at Chicago

- Sensor Platform Development – Airborne Viral Detection
- Multiphysics computation airflow modeling; BSL 2 aerosol chamber design and development - for calibration, testing and experimentation.
- MEMS elements and micro-fluidic platform engineering research towards the development of airborne pathogen and environmental monitoring systems.
- Instrumental in sourcing private market sponsored research funding for thesis project.

**Research Assistant –**

Oct 2015 – Jun 2016

Micro-Nano Fluidics Lab

**Center for Nano Science and Engineering, Indian Institute of Science, Bangalore**

- Design and fabrication of micro-fluidic devices for lab-on-a-chip handling and analysis of biological samples
- Collaboration with faculty and graduate students on a multi-disciplinary project to develop instrumentation for advanced medical point-of-care applications

**Research Assistant –**

Sept 2014 – Oct 2015

Optics and Microfluidics Instrumentation Lab

**Dept. of Instrumentation and Applied Physics, Indian Institute of Science, Bangalore**

- Research and experimentation toward the development of an optofluidic based portable fluorescence microscope
- Contributed to the development of flow cytometry analysis tools, using deconvolution algorithms for image enhancement and restoration

**Undergraduate Research Intern –**

Jan 2014 – Jun 2014

Applied Photonics Lab

**Dept. of Electrical Communication Engineering, Indian Institute of Science, Bangalore**

- Developed and validated theoretical ideas related to the modulation of optical signals using the principles of acousto-optics
- Compiled and presented the research undertaken and was awarded maximum marks for undergraduate thesis

## Publications

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M. Saxena, **N. Jayakumar**, S.S Gorthi. (2015). 'Handheld Fluorescence Microscopy based Flow Analyzer'. *The Journal of Fluorescence*. DOI: 10.1007/s10895-015-1749-0

**Jayakumar, N.**, Caffrey, V., Caffrey, M. and Paprotny, I., 2024. Towards Real-Time Airborne Pathogen Sensing: Electrostatic Capture and On-Chip LAMP Based Detection of Airborne Viral Pathogens. *Sensors and Actuators B: Chemical*. DOI: <https://doi.org/10.1016/j.snb.2024.135767>

## Patents

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**WO2022256736A1** - Airborne Monitor to detect SARS-CoV-2 Wild-Type and Mutations in Airborne Samples using Nucleic Acid Amplification Techniques (NAT)

## Skills

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<b>Technology Transfer</b>	- Patent Analysis, Market Research, Public Speaking
<b>Eng. Design/ Simulation/ Analysis</b>	- Fusion360, Shapr3D, COMSOL, Python, Inkscape
<b>Computational and DAQ</b>	- MATLAB, LabVIEW

## Non-Technical Experience

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- Judged undergraduate senior engineering design projects as a representative for the Office of Technology Management, UIC
- Prepared and guided technical education sessions of Nanofabrication Core Facility (NCF) at UIC
- Composed and directed music for advertisement jingles, plays and theater performances – worked with large groups, developed inter-personal and organizational skills.

## References

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Office of Technology Management  
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Michael Caffrey (Post-Doctoral Advisor)  
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