

Sumedha Prabhu  
Academic Casual  
School of Engineering  
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## Biography

**Dr Sumedha Nitin Prabhu** received a B.Sc. degree in Biotechnology from the University of Mumbai, India, in 2011, and a master's degree in Biotechnology from the University of Mumbai, India, in 2013. In December 2021, she had pursued a PhD in sensors and smart sensing systems at the School of Engineering, Faculty of Science and Engineering, Macquarie University, Sydney, Australia. Her PhD topic was "Development of a Point-of-Care Diagnostic Prototype System for Kidney Health Monitoring". Her research interest includes smart sensing systems, the internet of things, and embedded systems for the early detection of various diseases in humans.

Sumedha was awarded AUD 5000.00, a highly competitive Macquarie University Postgraduate Research Fund (PGRF) grant during her early third year of PhD. She has received two People's Choice Awards and a Silver Award during her PhD candidature.

On December 21 mid, Sumedha won second prize for Best PhD thesis 2021 from IEEE Sensors Council. She also won a Silver Award from the Early Career Women in STEM Paper & Grant Writing Association in August 2021. The competition was jointly organized by the University of Technology Sydney, Australian National University, The University of Sydney, Material Australia, Electron Devices Society, ARC Centre of Excellence in Exciton Science, Australian Institute of Physics, MDPI crystals journal, ARC Centre of Excellence for Enabling Eco-Efficient Beneficiation of Minerals and ARC Centre of Excellence for Transformative Meta-Optical Systems.

Sumedha has also participated in 3 Minute Thesis (3MT), an Asia Pacific level competition which was initiated by The University of Queensland, and she won a total of 3 prizes at Macquarie University level. In the 3MT competition, she initially won third prize at the School of Engineering level. On further levels, she also won two People's Choice Awards, first at the Faculty of Science and Engineering and second at the entire Macquarie University level. During this time, she was honoured twice with cash prizes and once with a small research grant.

Macquarie University immediately posted 3MT results and Sumedha's People's Choice Award win news on the entire Macquarie University level on their official university news webpage (<https://www.mq.edu.au/thisweek/2020/09/03/the-future-is-bright-macquaries-3mt-winners-wow-the-judges/?fbclid=IwAR1fOUpJhezbeutozjrexGcnNxcEw4Lpla7QHtYgaRLnKDDgeuANnU5bKTo#.X1d4b3kzaUk>). Macquarie University has declared Sumedha's 3MT People's Choice Award win on their official university website (<https://students.mq.edu.au/study/my-research-program/3-minute-thesis-competition>). The news was posted on Macquarie University official Twitter handle too. After her 3MT People's Choice win on the entire university level, the Macquarie University celebrated Sumedha's win with her official photoshoot. They also invited SBS world news presenter for Australia, Mr Anton Enus, to train Sumedha for an even better presentation style. Macquarie University had also audio-visually recorded her 3MT speech in their on-campus video recording studio. Her audio-visually recorded 3MT speech in the MQ video recording studio was posted by Macquarie University on their official YouTube channel (<https://www.youtube.com/watch?v=pdXO71T9bTQ&feature=youtu.be>). Sumedha's 3MT success was posted by the School of Engineering Department in their monthly newsletter. Her 3MT compete success was covered by journalist Rhea Nath from an Indo-Australian Media channel called IndianLink media over the telephonic interview and published Sumedha's success on their official media website (<https://www.indianlink.com.au/features/5-minute-home-kidney-health-test-wins-three-uni-awards/>), Twitter handle, LinkedIn as well as a Facebook page. Sumedha has also received an offer to commercialise my Point-of-Care diagnostic device prototype system on a larger scale from TiE Sydney (an entrepreneur supportive non-profit organization from the greater Sydney area).

On 20<sup>th</sup> June 2019, Sumedha was awarded a second prize for oral presentation at the HDR Conference held at the School of Engineering, Macquarie University, Sydney, Australia.

## Qualifications

PhD in Biomedical Engineering, PhD Student, Faculty of Science and Engineering  
15 Dec 2017 → 3 Dec 2021  
Award Date: 7 Feb 2022

M.Sc. in Biotechnology, M.Sc.  
10 Jun 2011 → 30 Apr 2013  
Award Date: 30 Apr 2013

B.Sc. in Biotechnology, B.Sc.  
10 Jun 2008 → 31 Mar 2011  
Award Date: 31 Mar 2011

## Employment

### Academic Casual

Academic Casual  
School of Engineering  
Macquarie University  
26 Jul 2021 → present

### IEEE Macquarie University Women In Engineering Affinity Group Vice Chair

IEEE  
Australia  
7 Dec 2020 → 7 Dec 2021

### Assistant Professor

Vidyaprakash Classes  
India  
1 May 2016 → 20 Jan 2017

### Assistant Professor

The Institute of Science  
India  
1 Jul 2014 → 30 Apr 2016

### Proprietress

Green City  
India  
1 Jan 2008 → present

## Research outputs

### Sensors and techniques for creatinine detection: a review

Prabhu, S. N., Mukhopadhyay, S. C. & Liu, G., 15 Jun 2022, In: IEEE Sensors Journal. 22, 12, p. 11427-11438 12 p.

### A unique developmental study in the design of point-of-care medical diagnostic device for kidney health care of metastatic brain cancer patients to avoid chemotherapy side-effects

Prabhu, S. N. & Mukhopadhyay, S. C., 2022, *Advances in communication, devices and networking: proceedings of ICCDN 2020*. Dhar, S., Mukhopadhyay, S. C., Sur, S. N. & Liu, C-M. (eds.). Singapore: Springer, Springer Nature, p. 357-365 9 p. (Lecture Notes in Electrical Engineering; vol. 776).

### IoT enabled PoC medical diagnostic MEMS-based sensor device for kidney healthcare

Prabhu, S. N. & Mukhopadhyay, S. C., 2022, *Sensing technology: proceedings of ICST 2022*. Suryadevara, N. K., George, B., Jayasundera, K. P., Roy, J. K. & Mukhopadhyay, S. C. (eds.). Cham, Switzerland: Springer, Springer Nature, p. 257-268 12 p. (Lecture Notes in Electrical Engineering; vol. 886).

### Development of MEMS sensor for detection of creatinine using MIP based approach - a tutorial paper

Prabhu, S. N., Gooneratne, C. P. & Mukhopadhyay, S. C., 15 Oct 2021, In: IEEE Sensors Journal. 21, 20, p. 22170-22181 12 p.

### Functionality evaluation of micro electro mechanical systems sensor for varied selective functionalization thickness to determine creatinine concentration

Prabhu, S. N., Mukhopadhyay, S. C. & Morello, R., 1 Aug 2021, In: IEEE Sensors Journal. 21, 15, p. 17244-17253 10 p.

### IoT-associated impedimetric biosensing for point-of-care monitoring of kidney health

Prabhu, S. N., Gooneratne, C. P., Hoang, K-A. & Mukhopadhyay, S. C., 1 Jul 2021, In: IEEE Sensors Journal. 21, 13, p. 14320-14329 10 p.

#### **Interdigital sensing system for kidney health monitoring**

Prabhu, S. N., Gooneratne, C. P., Hoang, K. A., Mukhopadhyay, S. C., Davidson, A. S. & Liu, G., 2021, *Interdigital sensing system for kidney health monitoring*. Mukhopadhyay, S. C., George, B., Roy, J. K. & Islam, T. (eds.). Cham, Switzerland: Springer, Springer Nature, p. 267-309 43 p. (Smart Sensors, Measurement and Instrumentation; vol. 36).

#### **Molecularly Imprinted Polymer-based detection of creatinine towards smart sensing**

Prabhu, S. N., Mukhopadhyay, S. C., Gooneratne, C. P., Davidson, A. S. & Liu, G., Dec 2020, In: *Medical Devices and Sensors*. 3, 6, p. 1-17 17 p., e10133.

#### **Development of a Point-of-Care diagnostic smart sensing system to detect creatinine levels**

Prabhu, S., Gooneratne, C., Hoang, K. A. & Mukhopadhyay, S., 2020, *2020 IEEE 63rd International Midwest Symposium on Circuits and Systems (MWSCAS): on-line proceedings*. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE), p. 77-80 4 p.

#### **Highly selective molecularly imprinted polymer for creatinine detection**

Prabhu, S. N., Mukhopadhyay, S. C., Davidson, A. S. & Liu, G., 2019, *2019 13th International Conference on Sensing Technology (ICST)*. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE), p. 1-5 5 p.

#### **Interdigital sensing system for detection of levels of creatinine from the samples**

Prabhu, S. N., Mukhopadhyay, S. C., Gooneratne, C., Davidson, A. S. & Liu, G., 2019, *2019 13th International Conference on Sensing Technology (ICST)*. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE), p. 1-6 6 p.

#### **IoT for smart homes**

Nag, A., Alahi, M. E. E., Afsarimanesh, N., Prabhu, S. & Mukhopadhyay, S. C., 2019, *Sensors in the age of the internet of things: technologies and applications*. Postolache, O. A., Sazonov, E. & Mukhopadhyay, S. C. (eds.). London: Institution of Engineering and Technology, p. 171-199 29 p. (IET Control, Robotics and Sensors Series; vol. 122).

#### **Green route synthesis of stable isotropic gold nanoparticles using leaf extract of Curcuma longa and their characterization**

Prabhu, S., 2015, In: *Advances in Applied Science Research*. 6, 8, p. 167-179 13 p.

## **Activities**

#### **IEEE Sensors Conference 2021**

Sumedha Prabhu (Participant)  
31 Oct 2021 → 4 Nov 2021

#### **2nd Annual Workshop of IEEE Sensors Council NSW Chapter and 5th Annual Workshop of IEEE IMS NSW Chapter**

Sumedha Prabhu (Participant)  
16 Apr 2021

#### **ICCDN-2020**

Sumedha Prabhu (Participant)  
19 Dec 2020 → 20 Dec 2020

#### **1st Annual Workshop of IEEE Sensors Council NSW Chapter and 4th Annual Workshop of IEEE IMS NSW Chapter**

Sumedha Prabhu (Participant)  
11 Dec 2020

#### **IEEE (External organisation)**

Sumedha Prabhu (Chair)  
7 Dec 2020 → 7 Dec 2021

**Marking the 3rd year presentations of Macquarie University Mechatronics Engineering students**

Sumedha Prabhu (Examiner)  
31 Oct 2020

**IEEE Sensors Conference 2020**

Sumedha Prabhu (Participant)  
25 Oct 2020 → 28 Oct 2020

**Girl's Voice**

Sumedha Prabhu (Speaker)  
13 Oct 2020

**63rd IEEE International Midwest Symposium on Circuits and Systems, MWSCAS 2020**

Sumedha Prabhu (Participant)  
9 Aug 2020 → 12 Aug 2020

**13th International Conference on Sensing Technology, ICST 2019**

Sumedha Prabhu (Participant)  
2 Dec 2019 → 4 Dec 2020

**13th International Conference on Sensing Technology, ICST 2019**

Sumedha Prabhu (Participant)  
2 Dec 2019 → 4 Dec 2019

**IEEE NSW SECTION UNITE 2019**

Sumedha Prabhu (Participant)  
9 Aug 2019

**Smart Sensing System for Early Detection of Side Effects of Brain Cancer Chemotherapy by Checking Levels of Creatinine from the Samples**

Sumedha Prabhu (Speaker)  
25 Jul 2019

**The development and testing of sensing system for detecting creatinine level using IoT system**

Sumedha Prabhu (Consultant)  
5 Jul 2019 → 5 Dec 2019

**School of Engineering HDR Conference Annual, Macquarie University**

Sumedha Prabhu (Speaker)  
20 Jun 2019

**The development and testing of a portable sensing system for detection creatinine level**

Sumedha Prabhu (Consultant)  
5 Jan 2019 → 5 Jun 2019

**IEEE (External organisation)**

Sumedha Prabhu (Member)  
Feb 2018

**A qualitative study of phytochemical analysis by HPTLC & study of antibacterial activity of various extracts of Rhus semialata**

Sumedha Prabhu (Consultant)  
30 Oct 2015 → 30 Mar 2016

**A study on the molecular interaction of human TNF-alpha with phytochemicals**

Sumedha Prabhu (Consultant)

30 Oct 2015 → 30 Mar 2016

**Biosorption of copper & ferrous by water hyacinth**

Sumedha Prabhu (Consultant)

30 Oct 2015 → 30 Mar 2016

**Cellulose producing bacteria and their effects on temperature, pH, & metal ions**

Sumedha Prabhu (Consultant)

30 Oct 2015 → 30 Mar 2016

**Research & Regulations: Challenges for the Pharmaceutical Industry**

Sumedha Prabhu (Participant)

8 Oct 2015 → 9 Oct 2015

**Preparation of nanocellulose cotton linters and its applications: preparation of a starch film**

Sumedha Prabhu (Consultant)

24 Oct 2014 → 25 Mar 2015

**Studies on metallopeptidase & amino acylase**

Sumedha Prabhu (Consultant)

24 Oct 2014 → 25 Mar 2015

**Research Scholars' Meet, The Institute of Science**

Sumedha Prabhu (Participant)

28 Feb 2013

**Bionics' 12 Fest**

Sumedha Prabhu (Participant)

9 Oct 2012 → 10 Oct 2012

**Oral Presentation at Intra-Departmental Conference**

Sumedha Prabhu (Speaker)

28 Feb 2012

**TOWARDS EXCELLENCE IN SCIENCE**

Sumedha Prabhu (Participant)

19 Jan 2012 → 20 Jan 2012

**"International Symposium on Stem Cell Biology"**

Sumedha Prabhu (Participant)

13 Jan 2012

**Bionics' 11 Fest: Department of Biotechnology, University of Mumbai**

Sumedha Prabhu (Participant)

21 Nov 2011 → 22 Nov 2011

**PALINDROME' 10**

Sumedha Prabhu (Participant)

20 Dec 2010

**CERTIFICATE COURSE IN BIOINFORMATICS BASICS**

Sumedha Prabhu (Participant)

26 Apr 2010 → 30 Apr 2010

**Orchid Genetic Diversity: Conservation & Commercialization**

Sumedha Prabhu (Participant)  
11 Dec 2009 → 12 Dec 2009

**One day workshop in Instrumentation**

Sumedha Prabhu (Participant)  
10 Oct 2009

**"ORCHID GENETIC DIVERSITY: CONSERVATION & COMMERCIALIZATION" Second Preparatory Workshop**

Sumedha Prabhu (Participant)  
19 Sep 2009

**"New Vistas in Research in Physics"**

Sumedha Prabhu (Participant)  
22 Aug 2009

**"ORCHID GENETIC DIVERSITY: CONSERVATION & COMMERCIALIZATION" First Preparatory Workshop**

Sumedha Prabhu (Participant)  
8 Aug 2009

**GeNeOpSiS**

Sumedha Prabhu (Participant)  
5 Dec 2008

**WONDERFUL WORLD OF INSECTS**

Sumedha Prabhu (Participant)  
3 Dec 2008

**WONDERFUL WORLD OF INSECTS**

Sumedha Prabhu (Participant)  
26 Aug 2008

**Prizes**

**3 Minute Thesis 2020 Third Prize at School of Engineering, Macquarie University**

Prabhu, Sumedha (Recipient), 12 Aug 2020

**3 Minute Thesis People's Choice Award 2020 Faculty of Science & Engineering, Macquarie University**

Prabhu, Sumedha (Recipient), 19 Aug 2020

**3 Minute Thesis People's Choice Award 2020 Macquarie University**

Prabhu, Sumedha (Recipient), 31 Aug 2020

**First prize at Research Scholars' Meet, The Institute of Science**

Prabhu, Sumedha (Recipient), 28 Feb 2013

**Post Graduate Research Fund (PGRF), Macquarie University**

Prabhu, Sumedha (Recipient), 6 Apr 2020

**Second Prize at School of Engineering HDR Conference, Macquarie University**

Prabhu, Sumedha (Recipient), 20 Jun 2019

**Silver Award**

Prabhu, Sumedha (Recipient), 22 Sep 2021

**Press/Media**

**5-minute home kidney health test wins three uni awards**

Sumedha Prabhu

16/09/20

4 items of Media coverage