

Ranita Biswas

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Current Position

2016–Present **Assistant Professor (on contract)**, *Indian Institute of Technology*, Roorkee.
Computer Science and Engineering

Education

2012–2016 **Doctor of Philosophy**, *Indian Institute of Technology*, Kharagpur.
Computer Science and Engineering

2010–2012 **Masters of Engineering**, *Indian Institute of Engineering Science and Technology*,
Shibpur, 87.78%.
Computer Science and Technology

2005–2009 **Bachelor of Technology**, *Kalyani Government Engineering College*, Maulana Abul
Kalam Azad University of Technology, CGPA – 8.77 out of 10.
Information Technology

2003–2005 **Higher Secondary**, *Nabadwip Balika Vidyalaya*, WBCHSE, 91.90%.
Science

2003 **Secondary**, *Nabadwip Balika Vidyalaya*, WBBSE, 88.50%.

PhD Thesis

Title *On Discretization of Sphere and Related Problems in 3D Integer Space*
Area Digital Geometry
Supervisor Dr. Partha Bhowmick, CSE DEPT., IIT KHARAGPUR

Masters Thesis

Title *Medical Image Registration in Computational Intelligence*
Supervisor Prof. Jaya Sil, CST DEPT., IEST SHIBPUR
Description Applying different computational intelligence based methodologies to register hand radiography images.

Bachelors Thesis

Title *Online Handwritten Bangla Character Recognition*
Supervisors Dr. Ujjwal Bhattacharya, CVPR UNIT, ISI KOLKATA & Partha Sarathi Banerjee,
IT DEPT., KGEC
Description Applying EM algorithm based clustering and HMM based classification to recognize online handwritten Bangla characters.

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Awards and Scholarships

- 2016 DST INSPIRE Faculty Award
- 2015 2nd prize in Demonstration Contest at IBM Day, IIT Kharagpur for presenting *Techtud: A Socio-technical Approach towards Contribution-centric Education*
- 2012 University Silver Medal – Topper in ME 2010-2012, Computer Science and Engineering, IEST Shibpur
- 2010 – 2012 MHRD-GATE Scholarship for ME course
- 2005 – 2009 Full-free Studentship for BTech course
- 2005 National Merit Scholarship for Higher Secondary Examination
- 1998 1st position in State-level Science Talent Search Examination

Research Interests

- Digital Geometry
- Computer Graphics
- Image Processing
- Discrete Geometry

Work Experience

- 2016 **Research Consultant**, PERFECIST TECHNOLOGIES, STEP, IIT Kharagpur.
Machine Learning based User Personalization Systems.
- 2009–2010 **Project Linked Person**, CVPR UNIT, INDIAN STATISTICAL INSTITUTE, Kolkata.
Development of Bangla OCR system in the DIT, INDIA sponsored consortium based project *Development of Robust Document Analysis and Recognition System for Printed Indian Scripts*.

Journal Publications

- JMIV'17 Ranita Biswas and Partha Bhowmick, *On the Functionality and Usefulness of Quadraginta Octants of Naive Sphere*, Journal of Mathematical Imaging and Vision, 2017, (in press, doi: <http://dx.doi.org/10.1007/s10851-017-0718-4>).
- DAM'17 Ranita Biswas, Partha Bhowmick, and Valentin E. Brimkov, *On the Polyhedra of Graceful Spheres and Circular Geodesics*, Discrete Applied Mathematics, Vol. 216, Part 2, Pages 362-375, 2017.
- TCS'16 Ranita Biswas and Partha Bhowmick, *From Prima Quadraginta Octant to Lattice Sphere through Primitive Integer Operations*, Theoretical Computer Science, Vol. 624, Pages 56-72, 2016.
- TCS'15 Ranita Biswas and Partha Bhowmick, *On Different Topological Classes of Spherical Geodesic Paths and Circles in \mathbb{Z}^3* , Theoretical Computer Science, Vol. 605, Pages 146-163, 2015.
- TVC'15 Ranita Biswas and Partha Bhowmick, *Layer the Sphere*, The Visual Computer, Springer, Vol. 31, Pages 787-797, 2015.

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International Conferences

- IWCIA'17 Ranita Biswas and Partha Bhowmick, *Construction of Persistent Voronoi Diagram on 3D Digital Plane*, 18th International Workshop on Combinatorial Image Analysis: IWCIA'17, 19-21 Jun 2017, Plovdiv, Bulgaria (to appear in LNCS proceedings).
- CTIC'16 Nabhasmita Sen, Ranita Biswas, and Partha Bhowmick, *On some local topological properties of naive discrete sphere*, 6th IAPR International Workshop on Computational Topology in Image Context: CTIC'16, 15-17 Jun 2016, Marseille, France LNCS 9667, Pages 253-264.
- DGCI'16 Ranita Biswas and Partha Bhowmick, *On Functionality of Quadraginta Octants of Naive Sphere with Application to Circle Drawing*, 19th IAPR International Conference on Discrete Geometry for Computer Imagery: DGCI'16, 18-20 Apr 2016, Nantes, France LNCS 9647, Pages 256-267.
- IWCIA'15 Ranita Biswas, Partha Bhowmick, and Valentin E. Brimkov, *On the Connectivity and Smoothness of Discrete Spherical Circles*, 17th International Workshop on Combinatorial Image Analysis: IWCIA'15, 24-27 Nov 2015, Kolkata, India, LNCS 9448, Pages 86-100.
- CGI'15 Ranita Biswas and Partha Bhowmick, *Layer the Sphere (TVC Special Issue Paper)*, 32nd Annual Conference Computer Graphics International: CGI'15, 24-26 June 2015, Strasbourg, France.
- DGCI'14 Ranita Biswas and Partha Bhowmick, *On Finding Spherical Geodesic Paths and Circles in \mathbb{Z}^3* , 18th IAPR International Conference on Discrete Geometry for Computer Imagery: DGCI'14, 10-12 Sep 2014, Siena, Italy, LNCS 8668, Pages 396-409.
- C3IT'12 Ranita Biswas and Jaya Sil, *An Improved Canny Edge Detection Algorithm Based on Type-2 Fuzzy Sets* 2nd International Conference on Computer, Communication, Control and Information Technology: C3IT'12, 25-26 Feb 2012, India, Elsevier Procedia Technology, Vol. 4, Pages 820-824, 2012.

Workshops/Pre-Workshop Schools (Attended)

- DigiGeo'14 *Research Promotion Workshop on Digital Geometry*, 23-25 June 2014, IEST Shibpur, India.
- WIGGA'13 *Workshop on Introduction to Graph and Geometric Algorithms*, 14-16 March 2013, IEST Shibpur, India.
- WALCOM'13 *WALCOM School on Graph and Geometric Algorithms*, 11-13 Feb 2013, ISI Kolkata & RKMVU Belur, India.

Volunteer

- IWCIA'15 *17th International Workshop on Combinatorial Image Analysis*, 24-27 Nov 2015, ISI Kolkata, India.
- SS'15 *Summer School for the School Students: Introduction to Programming through Python and C*, 25-29 May, 01-05 June 2015, IIT Kharagpur, India.
- ICPC'14 *ACM International Collegiate Programming Contest — Asia Regionals*, 07 Dec 2014, IIT Kharagpur, India.

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- ICPC'13 *ACM International Collegiate Programming Contest — Asia Regionals*, 14 Dec 2013, IIT Kharagpur, India.
- SS'13 *Summer School for the School Students: Introduction to Programming through Python and C*, 27-31 May, 03-07 June 2013, IIT Kharagpur, India.
- WALCOM'13 *7th International Workshop on Algorithms and Computation*, 14-16 Feb 2013, IIT Kharagpur, India.