

SUGATA BANERJI

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SUMMARY

- Associate professor of Computer Science at Lake Forest College.
- **Extensive research experience in the areas of Image Processing, Computer Vision, Pattern Recognition and Machine Learning.**
- **Fifteen years of experience in Matlab programming**, particularly using the Matlab Image Processing toolbox.
- **Post-doctoral research experience** at George Mason University, Fairfax, Virginia.
- **Undergraduate research experience** in Content-Based Image Retrieval at Indian Statistical Institute, Kolkata, India.
- **Fourteen years of teaching experience** in undergraduate courses including programming in C++, Java and Python, Data Structures and Algorithms, Computer Programming Languages, Database Management Systems, Web Development, AI, Machine Learning and Computer Vision.
- **Three-year industry experience** of Visual Studio .Net, JSP/Servlets, Siebel Tools, Siebel Analytics, Mercury Quality Centre, Microsoft Product Studio, MS SQL Server, MySQL, Oracle SQL and UNIX.
- Have **good communication skills** with training in body language, English usage and teaching methods in the US.
- A Mensa member with a love for writing, photography, painting and solving logical and mathematical problems.

WORK EXPERIENCE

- Working as associate professor (formerly as assistant professor) of Computer science at Lake Forest College, Lake Forest, Illinois since August 2015.
- Worked as a post-doctoral research fellow in the area of Computer Vision at George Mason University, Fairfax, Virginia from November 2013 to July 2015.
- Worked as a post-doctoral researcher in the area of Computer Vision at New Jersey Institute of Technology, Newark, NJ, USA from July 2013 to October 2013.
- Developed a web-based inventory management system for NJ Department of Transportation during Summer 2011 and Summer 2012 using **Java/ JSP/ MySQL**.
- Worked as a **Siebel** techno-functional consultant and developer at Wipro Technologies, Kolkata, India from January 2007 to August 2008 working on a project for Lexmark International.
- Worked as a **Siebel** consultant and tester at Wipro Technologies, Hyderabad, India from July 2005 to January 2007 working on a CRM implementation for Microsoft Corporation.

- **Detailed Employment History: August 2015 – Present**

- Employer name and Address: Lake Forest College, 555 North Sheridan Road Lake Forest, Illinois 60045, USA.
- Duties: Teaching courses in Mathematics and Computer Science. Involving students in research, and service to the Lake Forest College community.
- Technology used: MATLAB, Python, Java, C/C++, MySQL, PHP, HTML, CSS, JavaScript
- Hardware used: Computers with CPUs and GPUs, running Windows/Linux/macOS

- **Detailed Employment History: November 2013 – July 2015**

- Employer name and Address: George Mason University, 4400 University Drive, Fairfax, Virginia 22030, USA.
- Duties: Designing algorithms to analyze the vast image databases based on their image content and provide potential annotations and indexing for these images. Also, designing a database and a web-based image viewer system that lets the user specify keywords to search and view images that contain objects corresponding to those keywords and then allows the user to refine the search results by using one of the retrieved search results as a query.
- Technology used: MATLAB, MySQL, Java, C++, Python
- Hardware used: PCs running Linux

- **Detailed Employment History: August 2008 – October 2013**

- Employer name and Address: New Jersey Institute of Technology, University Heights, Newark, New Jersey 07103, USA.
- Duties: Teaching classes, lecturing labs, grading, and research in the area of computer vision.
- Technology used: MATLAB, Java, C++, Python.
- Hardware used: PCs running Microsoft Windows XP, Windows Vista, Windows 7 and Linux.

- **Detailed Employment History: July 2005 – July 2008**

- Employer name and Address: Wipro Technologies Limited, Doddakannelli, Sarjapur Road, Bangalore, Karnataka – 560 035, India.
- Duties: Development, Testing, deployment and maintenance of systems designed with Siebel.
- Technology used: Siebel, MS SQL Server, Oracle SQL.
- Hardware used: PCs running Microsoft Windows XP. Servers running Microsoft Windows Server and Unix.

EDUCATION

- **August 2008 – May 2013:** Ph.D. in Computer Science (GPA 3.89)
 - Dissertation: Novel Color and Local Image Descriptors for Content-Based Image Search
 - Department of Computer Science, New Jersey Institute of Technology, Newark, NJ, USA. Advisor: Dr. Chengjun Liu
- **September 2001 – June 2005:** B.E. in Information Technology (GPA 8.45/10)
 - West Bengal University of Technology, Kolkata, West Bengal, India.
- **2000:** Indian School Certificate (Class XII)
 - Overall score 88.0%
 - Boys' High School & College, Allahabad, Uttar Pradesh, India.
- **1998:** Indian Certificate for Secondary Education (Class X)
 - Overall score 94.2%
 - Boys' High School & College, Allahabad, Uttar Pradesh, India.

PUBLICATIONS

- E. Knizhnik, B. Rivera, A. Sinha, and **S. Banerji**, "Paintings-100: A Diverse Painting Dataset for Large Scale Classification," in *Proceedings of the Ninth International Conference on Advances in Signal, Image and Video Processing (SIGNAL 2024)*, March 10-14, 2024, Athens, Greece (Accepted).
- R. Bhattacharyya, P. Roy, **S. Banerji**, and S. Mitra, "Efficient Grading of Prostate Cancer WSI with Deep Learning," in *Proceedings of SPIE Medical Imaging 2024*, February 18-22, 2024, San Diego, CA, USA (Accepted).
- R. Chakraborty, and **S. Banerji**, "A Machine Learning-based Analysis of Autism Prevalence Rates across US States against Multiple Potential Explanatory Variables," *World Academy of Science, Engineering and Technology International Journal of Health and Medical Engineering*, vol. 17, no. 1 (2023), pp. 12-16. eISSN: 1307-6892.
- N. Ojha, and **S. Banerji**, "Intracranial Hemorrhage Detection and Classification," *Augmenting Neurological disorder Prediction and Rehabilitation using Artificial Intelligence*, edited by Bindu Menon and Anitha Pillai, 1-12. Cambridge, MA: Academic Press, 2021.
- **S. Banerji**, and S. Mitra, "Deep Learning in Histopathology: A Review," *WIREs Data Mining and Knowledge Discovery* 12, no. 1 (2022): e1439. <https://doi.org/10.1002/widm.1439>.
- **S. Banerji**, R. R. Zunker, and A. Sinha, "Finding Better Matches: Improving Image Retrieval with EFM-HOG," *International Journal on Advances in Software*, vol. 13, nos. 3 & 4, pp. 116-128, 2020.
- **S. Banerji**, and A. Sinha, "EFM-HOG: Improving Image Retrieval in the Wild," in *Proceedings of the Fourth International Conference on Advances in Signal, Image and Video Processing (SIGNAL 2019)*, June 2-6, 2019, Athens, Greece.

- R. R. Zunker, A. Sinha, and **S. Banerji**, "House Hunting: Image-based Geo-Localization of Buildings within a City," *In Proceedings of the 2019 5th International Conference on Computing and Data Engineering (ICCDE '19)*. ACM, New York, NY, USA, pp. 100-104.
- R. D. Meltser, **S. Banerji**, and A. Sinha, "What's that Style? A CNN-based Approach for Classification and Retrieval of Building Images," *In Proceedings of the International Conference on Advances in Pattern Recognition*, December 27-30, 2017, Bangalore, India
- J. Chakraborty, and **S. Banerji**, "Evaluating Predictive Models for Solar Energy Growth in the US States and Identifying Key Drivers," *In Proceedings of the International Conference on Renewable Energy and Environment*, November 1-3, 2017, Toronto, Canada.
- **S. Banerji**, and A. Sinha, "Painting Classification using a Pre-trained Convolutional Neural Network," *In Proceedings of the 2nd Workshop on Computer Vision Applications at the Tenth Indian Conference on Vision, Graphics and Image Processing*, December 19, 2016, Guwahati, India.
- A. Sinha, **S. Banerji**, and C. Liu, "New Color GPHOG Descriptors for Object and Scene Image Classification," *Machine Vision and Applications*, vol. 25, issue 2, pp. 361-375.
- **S. Banerji**, A. Sinha, and C. Liu, "New Image Descriptors Based on Color, Texture, Shape, and Wavelets for Object and Scene Image Classification," *Neurocomputing*, vol. 117, pp. 173-185, 2013.
- **S. Banerji**, A. Verma, and C. Liu, "LBP and Color Descriptors for Image Classification" in *Cross Disciplinary Biometric Systems*, C. Liu and V. Mago Eds., Springer-Verlag, pp. 205-225, 2012.
- **S. Banerji**, A. Sinha, and C. Liu, "HaarHOG: Improving the HOG Descriptor for Image Classification," *In Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, October 13-16, 2013, Manchester, UK.
- **S. Banerji**, A. Sinha, and C. Liu, "A New Bag of Words LBP (BoWL) Descriptor for Scene Image Classification," *In Proceedings of the Fifteenth International Conference on Computer Analysis of Images and Patterns*, August 27-29, 2013, York, UK.
- A. Sinha, **S. Banerji**, and C. Liu, "Novel Color Gabor-LBP-PHOG (GLP) Descriptors for Object and Scene Image Classification," *In Proceedings of the Eighth Indian Conference on Vision, Graphics and Image Processing*, December 16-19, 2012, Mumbai, India.
- A. Sinha, **S. Banerji**, and C. Liu, "Gabor-Based Novel Local, Shape and Color Features for Image Classification," *In Proceedings of the 19th International Conference on Neural Information Processing*, November 12-15, 2012, Doha, Qatar.
- A. Sinha, **S. Banerji**, and C. Liu, "Novel Gabor-PHOG Features for Object and Scene Image Classification," in *Proceedings of Structural, Syntactic, and Statistical Pattern Recognition*, Lecture Notes in Computer Science Volume 7626, pp 584-592, 2012.
- **S. Banerji**, A. Sinha, and C. Liu, "Novel Color HWML Descriptors for Scene and Object Image Classification," *In Proceedings of the 3rd International Conference on Image Processing Theory, Tools and Applications*, October 15-18, 2012, Istanbul, Turkey.

- **S. Banerji**, A. Sinha, and C. Liu, "Scene Image Classification: Some Novel Descriptors," *In Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics*, October 14-17, 2012, Seoul, Korea.
- **S. Banerji**, A. Sinha, and C. Liu, "Novel Color, Shape and Texture-based Scene Image Descriptors," *In Proceedings of the 2012 IEEE International Conference on Intelligent Computer Communication and Processing*, August 30- September 1, 2012, Cluj-Napoca, Romania.
- **S. Banerji**, A. Sinha, and C. Liu, "Object and Scene Image Classification Using Unconventional Color Descriptors," *In Proceedings of the 16th International Conference on Image Processing, Computer Vision, and Pattern Recognition*, July 16-19, 2012, Las Vegas, Nevada, USA.
- A. Sinha, **S. Banerji**, and C. Liu, "Gabor-Based Novel Color Descriptors for Object and Scene Image Classification," *In Proceedings of the 16th International Conference on Image Processing, Computer Vision, and Pattern Recognition*, July 16-19, 2012, Las Vegas, Nevada, USA.
- **S. Banerji**, A. Verma, and C. Liu, "Novel Color LBP Descriptors for Scene and Image Texture Classification," *In Proceedings of the 15th International Conference on Image Processing, Computer Vision, and Pattern Recognition*, July 18-21, 2011, Las Vegas, Nevada, USA.
- A. Verma, **S. Banerji**, and C. Liu, "A New Color SIFT Descriptor and Methods for Image Category Classification," *In Proceedings of the 2010 International Congress on Computer Applications and Computational Science*, December 4-6, 2010, Singapore.

CONFERENCE PRESENTATIONS

- R. Bhattacharyya, P. Roy, **S. Banerji**, and S. Mitra, "Efficient Grading of Prostate Cancer WSI with Deep Learning," *SPIE Medical Imaging 2024*, February 19, 2024, San Diego, CA, USA (Accepted).
- R. Chakraborty, and **S. Banerji**, "Analysis and Predictive Modeling of Anxiety and Depression Prevalence in the US Since the Onset of the COVID-19 Pandemic," *MidAtlantic Bioinformatics Conference*, Philadelphia, PA, USA, October 06, 2023.
- R. Chakraborty, and **S. Banerji**, "A Machine Learning-based Analysis of Autism Prevalence Rates across US States against Multiple Potential Explanatory Variables," *World Academy of Science, Engineering and Technology (WASET) Big Data Analytics in Healthcare*, Amsterdam, Netherlands, January 23, 2023 (Online).
- **S. Banerji**, and A. Sinha, "EFM-HOG: Improving Image Retrieval in the Wild," *The Fourth International Conference on Advances in Signal, Image and Video Processing (SIGNAL 2019)*, Athens, Greece, June 3, 2019.
- **S. Banerji**, and A. Sinha, "Painting Classification using a Pre-trained Convolutional Neural Network," *2nd Workshop on Computer Vision Applications at the Tenth Indian Conference on Vision, Graphics and Image Processing*, Guwahati, India, December 19, 2016.

- **S. Banerji** and J. Kosecka, "Indexing and Retrieval of Semantically Similar Scenes," *Mid-Atlantic Computer Vision (MACV) Workshop 2015*, University of North Carolina, Chapel Hill, North Carolina, USA, March 7, 2015.
- **S. Banerji**, A. Sinha, and C. Liu, "HaarHOG: A Novel Shape Descriptor for Image Search and Recognition," *Graduate Student Research Day, NJIT*, November, 2012.
- **S. Banerji**, A. Sinha, and C. Liu, "Object and Scene Image Classification Using Unconventional Color Descriptors," *The 16th International Conference on Image Processing, Computer Vision, and Pattern Recognition*, Las Vegas, Nevada, USA, July 18, 2012.
- **S. Banerji**, A. Verma, and C. Liu, "Novel Color LBP Descriptors for Scene and Texture Image Classification," *Gotham-Metro Condensed Matter Meeting*, New York, NY, USA, November 2011.
- **S. Banerji**, A. Verma, and C. Liu, "Novel Color LBP Descriptors for Scene and Texture Image Classification," *Graduate Student Research Day, NJIT*, November, 2011.
- **S. Banerji**, A. Verma, and C. Liu, "Novel Color LBP Descriptors for Scene and Image Texture Classification," *The 15th International Conference on Image Processing, Computer Vision, and Pattern Recognition*, Las Vegas, Nevada, USA, July 20, 2011.
- A. Verma, **S. Banerji**, and C. Liu, "New SIFT Descriptors for Image Category Classification," *Gotham-Metro Condensed Matter Meeting*, New York, NY, USA, November 2010.

INVITED TALKS

- Panelist on panel discussion "Trends on Body Networks" at The Fourth International Conference on Advances in Signal, Image and Video Processing (SIGNAL 2019), Athens, Greece, June 3, 2019.
 - Invited talk "Can Computers Think?" at Edgewood College, Madison, WI in October 2018.
 - Invited talk "Painting Classification and Other Tasks using Pre-trained Convolutional Neural Networks" at Indian Statistical Institute, Kolkata, India (December 2016).
 - "Seeing Like Humans Do: Convolutional neural networks for computer vision" at the Glassman Symposium as part of the Brain Awareness Week at Lake Forest College (November 2016).
 - "Software Testing and Other Aspects of the Software Design Process" at Edgewood College, Madison, WI (April 2016).
 - "How do Computers see?" at the Osher Lifelong Learning Institute, George Mason University (February 2015)
 - Presented an annual workshop on photography for the Graduate Students' Association at the New Jersey Institute of Technology (2009 – 2013).
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SELECT AWARDS

- NVIDIA GPU Grant: Received an NVIDIA Titan XP GPU from NVIDIA Corporation for conducting research in 2019
- Teaching Assistantship, Fall 2008 – Fall 2012.
- Department of Computer Science Travel Award, Fall 2012.
- Graduate Student Research Day Best CCS Poster, NJIT, Fall 2012.
- Graduate Student Association, NJIT, Special Achievement Award, Fall 2012.
- Graduate Student Association, NJIT, Special Achievement Award, Fall 2011.
National Talent Search Scholarship, Government of India, 1998-99.

ADMINISTRATIVE EXPERIENCE

- President of DeepCS, the graduate students' academic association for College of Computing Sciences at NJIT(2010-2013)
- Chair, Graduate Student Research Day, NJIT, Fall 2010.
- Administrative Assistant in High School Programming Contest organized by the Department of Computer Science at NJIT, Spring 2009 and Spring 2012
- Advising Assistant in CS international student orientation and placement examination, Fall 2011 and Spring 2013.

TEACHING EXPERIENCE

- Professor of Algorithms and Algorithm Analysis at Lake Forest College in Fall 2020, Fall 2021, and Fall 2022.
- Professor of Computer Science I (Python) at Lake Forest College in Fall 2015, Fall 2016, Fall 2017, Spring 2019, Summer 2020, Spring 2022 and Fall 2022.
- Professor of Computer Science II (Java) at Lake Forest College in Fall 2015, Spring 2016, Fall 2016, Spring 2017, Fall 2017, Spring 2018, Fall 2018, and Summer 2023.
- Professor of Data Structures and Algorithms at Lake Forest College in Spring 2016, Spring 2017, Spring 2018, Spring 2019, Spring 2020, and Fall 2023.
- Professor of Computer Programming Languages at Lake Forest College in Spring 2016 and Fall 2017.
- Professor of Mathematical Methods with Applications at Lake Forest College in Summer 2016, Summer 2020, January 2021, Summer 2022 and Summer 2023.

- Professor of Introduction to Web Designing at Lake Forest College in Summer 2016, Summer 2017, Fall 2020, Spring 2021, Summer 2022, and Summer 2023.
- Professor of Introduction to Database Management Systems at Lake Forest College in Spring 2017, Fall 2018, Spring 2020, Spring 2021, Spring 2022, Spring 2023, and Fall 2023.
- Professor of Programming for Data Applications at Lake Forest College in Spring 2020, Fall 2020, Spring 2021, Fall 2021, Spring 2022, Fall 2022, and Spring 2023.
- Professor of Introduction to Artificial Intelligence at Lake Forest College in Spring 2018.
- Professor of Introduction to Computer Vision and Machine Learning at Lake Forest College in Spring 2019, Spring 2021, Spring 2023, and Fall 2023.
- Lecturer for Roadmap to Computing using Python (CS100) at NJIT, Spring, 2013.
- Tutor for Computer Science at the Center for Academic and Personal Enrichment (CAPE) at NJIT, Summer 2012.
- Lecturer for Computer Programming and Graphics Problems using Python (CS 104) at NJIT, Fall, 2010 - Fall, 2012.
- Lab Instructor for Introduction to Computer Science IA & IB using Java (CS 110 & CS 111) at NJIT, Spring, 2009 - Spring, 2010.
- Lab Instructor for Introduction to Computer Science I in C++ (CS 115) at NJIT, Fall, 2008.

UNDERGRADUATE PROJECT EXPERIENCE

- Four-month research project on content-based image retrieval at Indian Statistical Institute, Kolkata, India under Dr. Sushmita Mitra.
- Two-month internship on LAN analysis and redesign at Alstom Limited, Allahabad, India.

TECHNICAL EXPERTISE

- **Programming Languages:** Working knowledge of C, C++, Java, VB.Net, VBA for Excel, VBScript, JSP, PHP, JavaScript, Python, PL/SQL and MATLAB.
- **CRM:** Extensive experience of working in Siebel Call Center 7.7.2, Siebel Tools 7.5.3, e-Script and Siebel Analytics.
- **RDBMS/DBMS:** Working knowledge of Oracle 9i/ 10g/ 11g, Microsoft SQL Server 2000, Microsoft SQL Server 2005 Beta 2, MySQL, MariaDB and Microsoft Access.
- **Web Servers:** Have designed web applications using IIS, Apache, Tomcat and BEA Weblogic.

INTERESTS AND ACTIVITIES

- Avid **quizzier** and won several awards for quizzing during school and college life.
- Love **writing, drawing and painting**. Won several awards for **creative writing** in school and college. Blogging since 2006
- **Translating** Bengali poetry into English.
- Passionate about **photography**. Worked as a student photographer with the University Communications department at NJIT in Summer 2009. Was part of three photography exhibitions held in Kolkata, India in 2011, 2013 and 2015.