

## Curriculum-Vitae

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**Name:** Jhimli Mitra  
**Date of birth:** 16<sup>th</sup> March 1978  
**Father's Name:** Sri Jyoti Prosad Mitra  
**Nationality:** Indian  
**Term Address:** 35 Residence Puebla,  
B-17, rue Puebla  
71200, Le Creusot, France  
**E-Mail ID:** [jhimlimitra@yahoo.com](mailto:jhimlimitra@yahoo.com)  
**Mobile:** +33 643832247

### **Career Objective:**

To enhance my skills in the domains of image processing and pattern recognition and continue research in the same for development of technologies that have societal values. Currently, I am a **full-time student in Erasmus Mundus M.Sc, Computer Vision and Robotics (VIBOT)** coordinated by University of Burgundy, Le Creusot, France in association with Heriot-Watt University, Edinburgh, UK and Universitat de Girona, Girona, Spain.

### **Experience:**

- **Total 5 years of experience** in working and teaching in the field of **Image processing and Pattern Recognition**.
- **1-year experience** in developing a **Natural Language Processing System**.
- I was working as a **Research Assistant** of Mr. Sarbajit Pal (V.E.C.C/DAE, Kolkata) for 2 years.
- I had been simultaneously working as a **full-time lecturer** (primarily on image processing and computer graphics) of JIS College of Engineering from Aug, 2004 to Sep, 2007.

### **Publications:**

- A research paper "Segmentation of noisy digital curves for approximation with cubic beziers" was published in IEEE-ICSIP (International Conference on Signal and Image Processing) 2006, Hubli, Karnataka, India in December, 2006.

- A research paper “Projection based statistical approach for handwritten character recognition” was published at ICCIMA (International Conference on Computational Intelligence and Multimedia Applications) '07 and IEEE Xplore, Sivakasi, Tamil Nadu, India in December, 2007.

### **Programming Knowledge:**

Skilled in programming languages like **FORTRAN 90, C, C++ (in WINDOWS and LINUX), VC++ (MFC), VB, MATLAB**, with good knowledge in data structures. Also, conversant with scripts like **HTML** and multimedia packages like **Adobe Photoshop, Flash, Sound Forge**.

### **Detailed Work Experience:**

1. Experience of developing Natural Language Processing System. The objective was to convert Bengali phonetics written in English to Bengali script (ADARSHA LIPI font). This project was submitted as Bachelor's thesis. I implemented the project under the guidance of my project guide Mr. Sarbajit Pal (Head, Accelerator Instrumentation Automation, VECC (Variable Energy Cyclotron Centre), Dept. of Atomic Energy, Govt. of India.
2. Experience of developing a system for recognition of printed digits and alphabets under the guidance of Mr. Sarbajit Pal and submitted as Master's project.
3. Worked on face recognition and facial expression analysis and generation. Here, face was chosen as a model, because it is considered to be the most complex image with various sets of curves. We implemented the face recognition part by drawing bezier curves over the features of a face (Eye-brows, eye boundaries, eye-balls, nose lining, lips and lower chin-line of a face). Then using a distance measure (modified Hausdorff distance) to compare between the normal face of one subject with the normal faces of other subjects. This yielded a 100% recognition rate. Then we calculated the modified Hausdorff distances between faces with expression of a particular subject and normal faces of other subjects including the subject under test. This method also yielded a 90% recognition rate.
4. Since, the bezier curves drawn over the features were hand drawn; we automated the drawing of bezier curves by an algorithm using parametric, cubic equation of bezier curves. We approximated any curve with Bezier curves, and calculated the error of fitting i.e. Integral Square Error for each of the curve segments. Before implementing the above method on faces, we tested our algorithm with some common shapes (as done by many scientists in their research paper). Our choice of using bezier curve is because; it is simple to understand, as we can change the structure of the curves by only changing the control points of the curve. Thus by comparing our methodology with other methodologies using polygonal approximation for fitting of curves, we yielded the least error of fitting.

5. Then we improved our result using various search techniques. First, we used an algorithm developed by ourselves called logarithmic search method. This is a semi-extensive search method, by which we obtained better results.
6. Later, we developed a segmentation algorithm which segmented a noisy digital curve into an optimal number of segments that were further approximated with cubic bezier curves to yield a smooth shape.
7. The research of segmentation of noisy digital curves was extended to the recognition of hand-written characters (specifically upper-case English alphabets). In this paper, we proposed a statistical method of recognition of the characters after segmentation by the given method.
8. I had been working as a full time lecturer in a private engineering college (JIS College of Engineering) in Kalyani, a town near Kolkata, West Bengal, India for last 3 years before I joined the Erasmus Mundus Masters in Computer Vision and Robotics (VIBOT) as a full-time student.
9. For the summer 2008, I had been working in the Le2i Laboratory, Le Creusot, France in defect detection of some industrial parts. Developed software in VB.Net for measurement of different industrial parts from images.
10. For the M.Sc thesis I had been working under Dr. Franck Marzani on “Multispectral Image Processing Applied to Dermatology” in the Le2i laboratory, (M2D+) team, Dijon, from Jan, 2009 to June, 2009.

#### **Academic Qualification:**

1. Passed **I.C.S.E** (10 level) in 1994 with **77.4%** marks.
2. Passed **W.B.H.S** (10+2 level) in 1996 with **57%** marks.
3. Passed **B. Sc** (Pure Sc. Pass) in 1998 from CU (Calcutta University), India with **58.6%** marks.
4. Passed **BCA (Bachelor of Computer Application)** from IGNOU (Indira Gandhi National Open University), India in 2002 with **62.17%** marks.
5. Passed **MCA (Master of Computer Application)** from IGNOU in 2004 with **63.17%** marks.
6. Passed 1<sup>st</sup> year of Erasmus Mundus **VIBOT** with **15.324/20**.

**Extra-Curriculum:** Keen interest in playing music on synthesizer and piano.