Subhajit Chaudhury

CONTACT INFORMATION

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EDUCATION

Indian Institute of Technology, Bombay, India — July 2012 - June 2014
M.Tech, Department of Electrical Engineering
GPA : **9.81 out of 10**

Jadavpur University, Kolkata, India — July 2008 - June 2012
B.E.(Hons.) Department of Electrical Engineering
GPA : **8.90 out of 10**

PUBLICATIONS

1) *Subhajit Chaudhury* and Hiya Roy, **Can fully convolutional networks perform well for general image restoration problems?**, International Conference on Machine Vision Applications MVA, 2017 (**Poster acceptance**)

2) *Subhajit Chaudhury*, Gaku Nakano, Jun Takada, Akihiko Iketani, **Spatial-temporal motion field analysis for crack detection on concrete surfaces**, IEEE Winter Conference on Applications of Computer Vision (WACV), 2017

3) Vijay Daultani, *Subhajit Chaudhury*, Kazuhisa Ishizaka, **Convolutional Neural Network Layer Re-ordering for acceleration**, 20th Workshop on Synthesis And System Integration of Mixed Information (SASIMI), Kyoto, Japan, 2016 (**Poster acceptance**)

4) Sourav Saha, Pritha Ganguly, *Subhajit Chaudhury*. **Vision based human pose estimation for virtual cloth fitting**. Proceedings of the 2014 Indian Conference on Computer Vision Graphics and Image Processing (ICVGIP), Bangalore, India, pp 60:1-60:6 (**Poster: Acceptance rate 26%**)

5) *Subhajit Chaudhury*, Subhasis Chaudhuri, **Volume preserving haptic pottery**, 2014 IEEE Haptics Symposium (HAPTICS), Houston, TX, 2014, pp.129-134. (**Oral: Acceptance rate 27%**)

6) Hiya Roy, *Subhajit Chaudhury*, **Digitalisation of a Peak Voltmeter display and subsequenterror minimisation using Polynomial Compensation technique**, National Conference on Electrical,Electronics and Computer Engineering, IEEE CALCON 2011, Kolkata, India

RESEARCH EXPERIENCE

NEC Central Research Labs, Japan — Oct 2014- Present
Position:Researcher
Computer vision based predictive infrastructure maintenance

- **Spatial-temporal motion analysis for invisible crack detection** — Apr 2015 - Sept 2016
  Developed a crack detection algorithm that identifies internal cracks by finding discontinues in dense 2D motion. Localization is formulated as an energy minimization problem on a Conditional Random Fields (CRF) framework for robust structured prediction, which was experimentally shown to be superior (by 0.14 to 0.22 F1 Score) to state-of-the-art image based methods.

- **Fully convolutional networks for crack detection** — Oct 2015 - Sept 2016
  Developed a fully convolutional network (FCN) based system for pixel-level crack localization from raw images. The proposed FCN method provides real-time performance (16fps for VGA images) with similar localization accuracy to state-of-the-art methods.

- **Accelerating convolutional neural nets by layer re-ordering.** — June 2016 - Sept 2016
  Obtained computational speed-up in CNN inference by rearranging pooling and activation layer

ordering for non-decreasing activation functions, which experimentally obtains up-to 4x speed-up in activation unit and 5% overall time improvements.

Indian Institute of Technology (IIT), Bombay July 2012- June 2014
Master of Technology (M. Tech) thesis, India Prof. Subhasis Chaudhuri

- **Volume preserving haptic pottery** May 2013 - Dec 2013
  Developed a realistic deformation model for interactive rendering of semi-solid clay based virtual pottery with volume preservation. Proposed model used circularly symmetrical basis elements, which enabled real time visual feedback at 25 fps and tactile feedback at 1000 Hz.

- **Feel Chat : 3D interactive virtual chat room with touch** Aug 2013 - June 2014
  Invented a virtual reality chatting system through VR headsets where users can feel their virtual environment via a wearable suit made up of small tactile vibrators. Proposed a User Datagram Protocol (UDP) data transfer system which enabled seamless multi-client environment sharing while providing real-time graphics rendering and tactile feedback.

- **Web-cam based virtual trial room** Feb 2014 - June 2014
  Developed a real-time virtual cloth fitting using generic web camera input by representing human joints with a Directed Acyclic Graph (DAG) obtained from body parts detection and structurally aligning the input garment to the edges of the DAG. Mentored intern students for developing the algorithm and implementation in OpenCV.

Patents

1) Subhajit Chaudhury and Gaku Nakano , **A device for automatic crack detection from 2D motion in video sequences**, PCT/JP2016/072700 (*filed at NEC*)

2) Subhajit Chaudhury and Gaku Nakano , **A device for direct 3D deformation estimation from 2D optical flow**, PCT/JP2016/001406 (*filed at NEC*)

3) Subhajit Chaudhury, Vineet Gokhale, Subhasis Chaudhuri , **A virtual reality system and method for providing synchronous tactile feedback for user interaction**, Indian Patent, 503/MUM/2015 (*filed at IIT Bombay*)

Awards and Achievements

- Secured All India Rank **33 out of 110,125** students in Electrical Engineering, GATE-2012.
- Secured All India Rank **125 out of 72,680** students in Electrical Engineering, GATE-2011.
- Secured rank **86** in West Bengal Joint Entrance Examination, 2008 for Engineering (among about 80,000 students)
- Ranked 152 (state-rank) in All India Engineering Entrance Examination (AIEEE), 2008
- Awarded **1st** position prize for winning Don-Bosco Inter-School coding competition.

Other Relevant projects

1) Can fully convolutional networks perform well for general image restoration problems?
Proposed a fully convolutional network model for learning direct end-to-end mapping between corrupted images and desired clean images for image denoising and restoration task.

2) Deep Hyper spectral image classification
Implemented classification of Hyperspectral Satellite Images Using Convolutional Neural Networks.

Computer Skills

- **Programming Languages** : *C, C++, Java, Python*
- **Tools** : *Matlab, OpenCV, CUDA, OpenGL*
- **Machine learning Tools** : *scikit-learn, Theano + Lasagne, Keras, Caffe, Matconvnet*

Extra curricular activities

- Executive Council member of IIT Bombay Alumni Association in Tokyo from 2015.
- Passed Japanese Language Proficiency Test, N4 level.(Ability to follow general conversations)
- Trained in classical guitar lessons and performed at many events.
- Hobbies : Photography, music composition, cooking, hiking