Ketan Bacchuwar

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RESEARCH INTERESTS — Image processing • Machine learning

Image processing • Machine learning • Optimization • Computer Vision

EDUCATION — PhD • Engineering • Applied mathematics • Image processing

UNIVERSITY PARIS-EST AND GE HEALTHCARE (Buc, France) ..... **Jan. 2015 – Present**
Subject: Image processing for the semantic analysis of the progress of interventional procedures in cardiology
– Joint PhD between ESIEE Paris' LIGM lab and GE Healthcare's Image Processing and Clinical Applications Laboratory (CIFRE industrial research agreement), co-supervised by Régis Vaillant, Laurent Najman and Jean Cousty [1, 2, 3, 4, 5]

- ↪ Conceptualized and formulated PCI procedure modeling
- ↪ Devised method for segmentation of low contrasted object
- ↪ Designed algorithm and developed software for vessel of intervention detection
- ↪ Involved in GE Healthcare's intern recruitment process
- ↪ Awarded for presentation to GE Healthcare's worldwide technology council

Courses taken: Machine learning for medical imaging (summer school), deep learning specialization (Coursera/deeplearning.ai)

ECOLE NORMALE SUPERIEURE DE CACHAN (Cachan, France) ..... **2013 – 2014**
M2-MVA *Master of Science (research-oriented MS), "Mathematics, Vision, Learning"*

- ↪ Medical image analysis
- ↪ Machine learning for computer vision
- ↪ Kernel methods for machine learning
- ↪ Object recognition and computer vision
- ↪ Convex optimization
- ↪ Statistical computing on manifolds

NATIONAL INSTITUTE OF TECHNOLOGY (NIT) (Warangal, India) ..... **2009 – 2013**
Bachelores of Technology in Electrical and Electronics Engineering

- ↪ Co-founded and mentored an image processing research group of students **[6, 7, 8, 9]**

EXPERIENCE — 3 experiences

PHILIPS HEALTHCARE (**Master's thesis** – Suresnes, France) **2014**
Anatomically constrained kidney segmentation in 3D ultrasound images – supervised by **Vincent Auvray** *5 months*

- ↪ Analyzed methods for 3D statistical shape analysis
- ↪ Proposed k-means in quaternion formulation **[10]**

CENTER FOR BIOMEDICAL IMAGE ANALYSIS, MASARYK UNIVERSITY (Brno, Czech Republic) **2012**
Road detection using similarity search – supervised by **David Svoboda** *3 months*

- ↪ Developed software for automatic robot navigation; Vision based navigation

COMPUTER VISION AND ARTIFICIAL INTELLIGENCE LAB - IISC (Bangalore, India) **2011**
Detection of image inpainting and copy-paste forgery – supervised by **K.R. Ramakrishnan** *3 months*

- ↪ Designed algorithm for multiple forgery detection in digital forensics **[11]**

COMPUTER SKILLS • LANGUAGES — C/C++ • MATLAB • Python • Bash

Advanced: C/C++, Python, MATLAB, Bash • **Basics**: Java, HTML/CSS • **Office / Editors**: LaTeX, Microsoft Office, Vim
English: Full professional proficiency • **French**: Professional working proficiency • **Hindi, Marathi, Telugu**

AWARDS AND HONORS

Sophie Germain International Scholarship ..... **Sept 2013**

- ↪ awarded by Fondation Mathematiques Jacques Hadamard (FMJH), France

Institute Merit Scholarship **2010, 2011**

- ↪ awarded by National Institute of Technology Warangal, India

OTHER — References upon request

References available upon request • Personal interests: Travelling, Photography, Community service, Cooking and Gastronomy

PUBLICATIONS — 4 publications, 1 patent during PhD

[1] **K. Bacchuwar**, J. Cousty, R. Vaillant, and L. Najman, "Scale-space for empty catheter segmentation in PCI fluoroscopic images," in International Journal of Computer Assisted Radiology and Surgery, Vol. 10 (Springer, 2017) pp. 1179–1188.

[2] **K. Bacchuwar**, J. Cousty, R. Vaillant, and L. Najman, "VOIDD: Automatic Vessel-of-Intervention Dynamic Detection in PCI Procedures," in Intravascular Imaging and Computer Assisted Stenting, and Large-Scale Annotation of Biomedical Data and Expert Label Synthesis (Springer, MICCAI 2017) pp. 47–56.

[3] **K. Bacchuwar**, J. Cousty, R. Vaillant, and L. Najman, "Towards semantic image analysis of PCI: Empty catheter segmentation," Proceeding of the CVII-STENT workshop at MICCAI 2016 (2016).

[4] **K. Bacchuwar**, J. Cousty, R. Vaillant, and L. Najman, "VOIDD: Automatic vessel of intervention dynamic detection and tracking in PCI Procedures," Medical Image Analysis, (forthcoming).

[5] C. Riddell, R. Vaillant, and K. S. Bacchuwar, "SYSTEM AND METHOD FOR ADJUSTING A RADIATION DOSE DURING IMAGING OF AN OBJECT WITHIN A SUBJECT," (2017).

[6] A. Singh, **K. Bacchuwar**, and A. Bhasin, "A survey of OCR applications," International Journal of Machine Learning and Computing **2** (2012).

[7] **K. Bacchuwar**, A. Singh, A. Choubey, D. Kumar, and S. Karanam, "An OMR based automatic music player," in Computer Research and Development (ICCRD), 2011 3rd International Conference on, Vol. 1 (IEEE, 2011) pp. 174–178.

[8] **K. Bacchuwar**, A. Singh, and A. Choubey, "A novel GA based OCR enhancement and segmentation methodology for marathi language in bimodal framework," Information Systems for Indian Languages , 271 (2011).

[9] A. Singh, D. Kumar, A. Choubey, **K. Bacchuwar**, and S. Karanam, "Annotation supported contour based object tracking with frame based error analysis," International Journal of Machine Learning and Computing **2**(4), 526 (2012).

[10] R. Ardon, R. Cuingnet, **K. Bacchuwar**, and V. Auvray, "Fast kidney detection and segmentation with learned kernel convolution and model deformation in 3d ultrasound images," in Biomedical Imaging (ISBI), 2015 IEEE 12th International Symposium on (IEEE, 2015) pp. 268–271.

[11] **K. Bacchuwar** and K. Ramakrishnan, "A jump patch-block match algorithm for multiple forgery detection," in Automation, Computing, Communication, Control and Compressed Sensing (iMac4s), 2013 International Multi-Conference on (IEEE, 2013) pp. 723–728