

Nikesh Bajaj

Curriculum Vitae

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RESEARCH INTERESTS

Machine learning & Signal processing | Mathematical modeling | Convex optimization | EEG signal processing | Audio & Image processing | Deep learning

WORK EXPERIENCE

Teaching

2017–Present **Teaching Assistant**, *Queen Mary University of London*, UK.

- Coding for scientist (2017)
- Digital signal processing (2017)
- Signals & systems theory (2018)
- Data Analytics (2018)
- Security engineering (2018)

2010–2015 **Assistant Professor**, *Lovely Professional University*, India.

In Electronics and Communication Engineering department, Digital signal processing domain, responsible for designing and conduction of courses and labs related to signal processing.

- Courses I taught : Signals & Systems, Digital Signal Processing, Advanced Transform Techniques, Advanced Digital Signal Processing, Adaptive Signal Processing, Speech and Audio processing, Information theory and coding, Cryptography.
- Workshops : Introduction to Machine Learning, Statistics for Data Analytics, Python for school teachers & university students, MATLAB for student & faculties.

Other

2006-2008 **Customer care officer**, *Colwell & Salmon Communications*, Noida, India.

International BPO & KPO - Market research center

MACHINE LEARNING & SIGNAL PROCESSING (Activities & achievements)

Challenges & Competitions **Second Place Winner Team** – Urban Analytics Data Dive: Second place winner for Urban Analytics Data Dive held at The Alan Turing Institute and hosted in collaboration with the Office of National Statistics –ONS Data Science campus. **25-26 July 2017**

- **Second Place Winner Team** – Person Identification from Audiovisual- challenge in summer school 2017 held at Centre of Intelligent Sensing, Queen Mary University of London, **7-9 Sep 2017**
- **Kaggle** – I worked on Kaggle's competitions of Machine Learning and Data Science, **2012-2014**. Profile : <https://www.kaggle.com/nikeshbajaj/competitions>

Data Study Group An extensive week-long work on health care project - *Predicting Language Outcome and Recovery After Stroke (PLORAS)*, problem was posed by University College London at The Alan Turing Institute, London. **16-20 April 2018**.

- A week-long event, worked with team for Urban Analytics posed by Defence Science and Technology Laboratory (DSTL) at The Alan Turing Institute, London. **22-26 May 2017**

- Training Attended faculty development program on Data Analytics by Cognizant Technological Solutions, India
- Attended workshop on Virtual Lab on Biomedical Signal and Image Processing organized by Indian Institute of Technology Roorkee –IITR -India
- Seminar Presented seminar on *Ensemble approaches for classification and regression* in summer school - Machine Learning: A computational Intelligent Approach, University of Genoa, Italy
- Mentor Currently mentor for Coursera course – Audio Signal Processing for Music Applications

EDUCATION

- 2015–2018- **PhD in Electronics Engineering and Computer Science**, *Queen Mary University of London, UK & University of Genoa, Italy*, Joint program.
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 - o PhD work is focused on investigation and identification of auditory attention from psychophysiological signals. I designed an experiment based on cognitive aspect of attention and collected signals (EEG, GSR, PPG) along with other active responses from 25 participants. The collected data is used for statistical analysis of responses and signal processing for designing the model for prediction of attention level.
 - o Supervisors: Dr. Jesús Requena Carrión (UK) and Dr. Francesco Bellotti (Italy).
- 2008–2010 **M.Tech. in Communications & Information Systems**, *Aligarh Muslim University*, India.
- o Major courses: Digital signal processing, Speech and audio processing, Image processing, Information theory & coding, Secure communications.
 - o Thesis title: **Cryptanalysis of some block and stream ciphers with signal processing techniques.**
 - o Supervisor: Prof. Omar Farooq (India).
- 2003–2007 **B.Tech. in Electronics & Telecommunications**, *Institute of Electronics and Telecommunication Engineers- IETE*, India.

PROGRAMMING & FRAMEWORK

- Python Numpy, Pandas, Matplotlib, Scipy, Scikit-Learn, Scikit-Image, Opencv
- Framework Tensorflow, Keras
- Other R, MATLAB, C# , Java, P5js(Javascript), Chuck(Music programming language)

OTHER AWARDS AND ACHIEVEMENTS

- Grants JD-ICE- Joint Doctoral Course in Interactive and Cognitive Environment program for PhD between Queen Mary University of London & University of Genoa
- Ministry of Human Resource Development (MHRD), Government of India -funding for masters
- Awards Received Best Faculty Award 2014-15 for outstanding performance from Cognizant Technology Solutions, India.
- Best Faculty Facilitator Award 2015– for being facilitator for *Uttara-Scientia Divina*-Student Organization at LPU, India
- Test Graduate Aptitude Test in Engineering: GATE-2010, 2008, 2007, 2006 Qualified. GATE is conducted by Indian Institutes of Technology (IITD, IITB, IITK), that led to MHRD funding for Masters in Technology in India.

COURSES & CERTIFICATIONS

- Machine Learning
- Machine Learning (*Coursera*)
 - Probabilistic Graphical Models 1 (*Coursera*)
 - Machine Learning for Musicians and Artists (*Kadenze*)
 - Regularization Methods for Machine Learning (*Univ. of Genova*)
 - Machine Learning : A Computational Intelligent Approach (*Univ. of Genova*)
 - Data Fusion and Bayesian Network (*Univ. of Genova*)
 - Statistical Learning (*Stanford Online*)
 - Neural Network for Machine Learning (*Coursera*)
- Specialization in Deep Learning (Coursera)
- Neural Network and Deep Learning
 - Improving Deep Neural Networks: Tuning Hyperparameters
 - Structuring Machine Learning Projects
 - Convolutional Neural Networks
 - Sequence Models
- Signal Processing
- Digital Signal Processing (*Coursera*)
 - Audio Signal Processing for Music Applications (*Coursera*)
 - Image and video processing (*Coursera*)
 - Introduction to Digital Sound Design (*Coursera*)
 - Computational photography (*Coursera*)

SERVICES AS REVIEWER

- IEEE Transactions on Cognitive and Developmental Systems
- IEEE Transactions on Intelligent Transportation Systems
- Springer: Neural Computing and Applications (NCAA) Journal

PUBLICATIONS

1. Bajaj, Nikesh, Francesco Bellotti, Riccardo Berta, and Alessandro De Gloria. **"A Neuroscience Based Approach to Game Based Learning Design"**. In International Conference on Games and Learning Alliance, pp. 444-454. Springer, Cham, 2016.
2. Dogra, Ashish Kumar, Nikesh Bajaj, and Harish Kumar Dogra. **"Facial Expression Recognition using Neural Network with Regularized Back-propagation Algorithm"**. International Journal of Computer Applications 77, no. 5 (2013).
3. Kharbanda, Mohina, and Nikesh Bajaj. **"An exploration of fractal art in fashion design"**. In Communications and Signal Processing (ICCSP), 2013 International Conference on, pp. 226-230. IEEE, 2013.
4. Kaul, Nitin, and Nikesh Bajaj. **"Audio in Image Steganography based on Wavelet Transform"**. International Journal of Computer Applications 79, no. 3 (2013).
5. Deora, Divya, and Nikesh Bajaj. **"Indian sign language recognition"**. In Emerging Technology Trends in Electronics, Communication and Networking (ET2ECN), 2012 1st International Conference on, pp. 1-5. IEEE, 2012.
6. Bajaj, Nikesh, and Rahul Kashyap. **"Extension of wavelet family in fractional fourier domain"**. In Emerging Technology Trends in Electronics, Communication and Networking (ET2ECN), 2012 1st International Conference on, pp. 1-4. IEEE, 2012.

7. Kaur, Rosepreet, and Nikesh Bajaj. **"Enhancement in Feedback Polynomials of LFSR used in A5/1 Stream Cipher"**. International Journal of Computer Applications 57, no. 19 (2012).
8. Bajaj, Nikesh. **"Enhancement of A5/1: Using variable feedback polynomials of LFSR"**. In Emerging Trends in Networks and Computer Communications (ETNCC), 2011 International Conference on, pp. 55-60. IEEE, 2011.
9. Bajaj, Nikesh. **"Effects of Parameters of Enhanced A5"**. International Journal of Computer Applications 2, no. 2 (2011): 7-13
10. Bajaj, Nikesh, and Amit Thakur. **"Enhancement of RC5 for image encryption"**. In Image Information Processing (ICIIP), 2011 International Conference on, pp. 1-5. IEEE, 2011.
11. Singh, Ajmer, and Nikesh Bajaj. **"Analysis of signals in Fractional Fourier Domain"**. In Emerging Trends in Networks and Computer Communications (ETNCC), 2011 International Conference on, pp. 259-262. IEEE, 2011.