

# FAYYAZ UL AMIR AFSAR MINHAS

## PROFESSIONAL EXPERIENCE

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- Oct. 2007 –Aug. 2010 and June 2014 till Now   PIEAS, Islamabad, Pakistan
- Associate Professor at the Department of Computer & Information Sciences, Pakistan Institute of Engineering & Applied Sciences (PIEAS), Pakistan engaged in teaching and research.
  - Taught courses: Quantum Programming, Cancer Biology and Bioinformatics, Machine Learning, Machine Learning in Bioinformatics, Artificial Intelligence, Pattern Classification and Recognition, Computational Biomolecular Design, Bioinformatics, Applied Bioinformatics, Optimization Techniques, Computer Graphics and Python programming.
  - Lab Administration: Principal Investigator of two labs at PIEAS: PIEAS Biomedical Informatics Lab and PIEAS Data Science Lab
  - PhD Supervision: 04 (ongoing), Co-Supervision: 01 (ongoing)
  - MS Thesis Supervision: 12, Co-Supervision: 02
  - BS Thesis Supervision: 7, Co-supervision: 04
  - Deputy Warden PIEAS Hostels (2015-2017)

## EDUCATION

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8/2010 – 5/2014   Colorado State University, Fort Collins, Colorado, USA

### **Ph.D. (Computer Science)**

- Recipient of Fulbright scholarship (2010-14)
- Area: Computer Science / Machine Learning in Bioinformatics

2005 - 2007   Pakistan Institute of Engineering & Applied Sciences (PIEAS), Nilore, Islamabad, Pakistan

### **MS (Systems Engineering)**

- With distinction and certificate of merit
- Area: Digital Signal Processing and Control Systems

2001 - 2005   Pakistan Institute of Engineering & Applied Sciences , PIEAS, Nilore, Islamabad, Pakistan

### **BS (Computer & Information Sciences)**

- With distinction and certificate of merit
- Major Subjects: Machine Learning and Image Processing

## GRANTS, AWARDS & HONOURS

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2017

- **HEC Institutional Strengthening grant, Establishment of Data Science Lab at PIEAS, Dr. Fayyaz Minhas (PI), PKR**

2.0 Million

- **National Research Programme for Universities Competitive Research Grant, “In silico analysis and experimental validation of host-pathogen protein interaction and interfaces” Dr. Fayyaz Minhas (PI), PKR 4.8Million**

October 2012

**International Presidential Fellow at Colorado State University**

May 2012

**Membership of Upsilon Pi Epsilon (UPE) computing honor society CSU chapter**

August 2010

**J. William Fulbright Scholarship for PhD studies at Colorado State University by US State Department**

12 August 2009

**National Youth Award (NYA) in Science & Technology by the Ministry of Youth Affairs, Govt. of Pakistan for excellent academic performance and research**

2009

**Distinction Certificate for MS (System Engineering) by Pakistan institute of Engineering & Applied Sciences (PIEAS)**

2007

**PIEAS Gold Medal for Outstanding Academic Performance by Pakistan institute of Engineering & Applied Sciences (PIEAS)**

2007

**PIEAS Gold Medal for Best Research Thesis**

1999-2005

**Fauji Foundation Talent Award for excellent academic performance in higher secondary school examination (2001-05)  
Scholarship by Rawalpindi Board of Intermediate & Secondary Education for excellent academic performance in secondary school examination (1999-2001)**

## RESEARCH INTERESTS

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Machine Learning, Machine learning in Biomedical Informatics, Deep Learning, Biomedical Signal and Image Processing.

## RESEARCH PUBLICATIONS

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### ■ Book Chapters

- M. Arif, **Fayyaz Minhas**, M.U. Akram, and A. Fida, *Arif Index for Predicting the Classification Accuracy of Features and its Application in Heart Beat Classification Problem*, Advances in Knowledge Discovery and Data Mining, Ed. Thanaruk Theeramunkong, Boonserm Kijsirikul, Tu-Bao Ho, PAKDD2009 Proceedings, LNAI 5476, pp. 491-498, Springer-Verlag Berlin Heidelberg, 2009.

### ■ Journal Publications

- Total Journal Impact Factor (JIF): ~50, Citations: >650): Links to papers available at <http://faculty.pieas.edu.pk/fayyaz/pubs.html>
  - “AMAP: Hierarchical Multi-label Prediction of Biologically Active and Antimicrobial Peptides”, Sadaf Gull and **Fayyaz Minhas**, in *Computers in Biology and Medicine* (accepted), February 2019. (JIF 2.113)
  - “Learning protein binding affinity using privileged information”, Wajid Abbasi, Amina Asif, Asa Ben-Hur and **Fayyaz Minhas**, *BMC Bioinformatics* (2018) doi: 10.1186/s12859-018-2448-z. JIF: 2.213
  - “PHURIE: Hurricane Intensity Estimation from Infrared Satellite Imagery using Machine Learning”, Amina Asif, Muhammad Dawood, Bismillah Jan, Javaid Khurshid, Mark DeMaria, and **Fayyaz Minhas**, in *Neural Computing and Applications*, DOI: <http://dx.doi.org/10.1007/s00521-018-3874-6>, 2018 JIF: 4.213
  - “Training host-pathogen protein–protein interaction predictors”, Abdul Hannan Basit, Wajid Arshad Abbasi, Amina Asif, Sadaf Gull and **Fayyaz Minhas**, in *Journal of Bioinformatics and Computational Biology*, Vol. 16, No. 04, 1850014 (2018). JIF: 0.931
  - “Correlation Filters for Detection of Cellular Nuclei in Histopathology Images”, Asif Ahmad, Amina Asif, Nasir Rajpoot, Muhammad Arif, **Fayyaz Minhas**, *J Med Syst* (2018) 42: 7. <http://dx.doi.org/10.1007/s10916-017-0863-8>, (online release 2017, JIF: 2.456)
  - “CaMELS: In silico prediction of calmodulin binding proteins and their binding sites”. *Proteins: Structure Function and Bioinformatics*, W. Abbasi, A. Asif, S. Andleeb, **Fayyaz Minhas**, 85(9), pp. 1724–1740. (JIF: 2.499) <https://doi.org/10.1002/prot.25330>
  - “Amino Acid Composition predicts prion activity”, **Fayyaz Minhas**, Eric D. Ross and Asa Ben-Hur, *PLoS Computational Biology*, 13(4): e1005465. <https://doi.org/10.1371/journal.pcbi.1005465>, 2017. (JIF: 4.587)
  - “CAFÉ-Map: Context Aware Feature Mapping for mining high dimensional biomedical data”, **Fayyaz Minhas**, Amina Asif and M. Arif, in *Computers in Biology and Medicine*, vol. 79, pp. 68-79, Oct. 2016 (JIF: 1.836).
  - “Issues in Performance Evaluation for Host-Pathogen Protein Interaction Prediction”, Wajid A. Abbasi and **Fayyaz Minhas**, in *Journal of Bioinformatics and Computational Biology*, vol. 14, no. 3, 1650011, January 2016. (JIF: 0.931)
  - “RAMClust: A Novel Feature Clustering Method Enables Spectral-Matching Based Annotation for Metabolomics Data.”, Corey D. Broeckling, **Fayyaz Minhas** (co-first author), Steffen Neumann, Asa Ben-Hur, and Jessica E. Prenni in *Analytical Chemistry*, vol. 86, no. 14, pp 6812–6817, June 2014.(JIF: 6.320)
  - “PAIRpred: Partner-specific prediction of interacting residues from sequence and structure”, **Fayyaz Minhas**, Brian J. Geiss and Asa Ben-Hur, in *Proteins: Structure, Function and Bioinformatics*, DOI: 10.1002/prot.24479. (JIF: 2.499)
  - “Multiple instance learning of Calmodulin binding sites”, **Fayyaz Minhas** and Asa Ben-Hur, *Bioinformatics* (2012) 28(18): i416-i422 (JIF: 7.307).
  - “MOX: A Novel Global Optimization Algorithm Inspired from Oviposition Site Selection and Egg Hatching Inhibition in Mosquitoes”, **Fayyaz Minhas** and M. Arif, *Applied Soft Computing*, Volume 11, Issue 8, December 2011, Pages 4614–4625. (JIF: 3.541)
  - “Automated Classification of Liver Disorders using Ultrasound Images”, **Fayyaz Minhas**, Durr-e-Sabih, Mutawarra Hussain, *Journal of Medical Systems*, November 2011. (JIF: 2.456)
  - “Pruned Fuzzy K-nearest neighbor Classifier for Beat Classification”, M. Arif, **Fayyaz Minhas** and M. U. Akram, in *Journal of Biomedical Science and Engineering*, (2010), no. 3, pp. 380-389, April 2010.(JIF: 0.99)
  - “Detection and Localization of Myocardial Infarction using K-Nearest Neighbor Classifier”, M. Arif, I.A. Malagore, **Fayyaz Minhas**, *Journal of Medical Systems*, DOI 10.1007/s10916-010-9474-3, 2010. (JIF: 2.456)
  - “Robust Electrocardiogram (ECG) beat classification using Discrete Wavelet Transform”, **Fayyaz Minhas** and M. Arif, in *Physiological Measurements*, 29 (2008), pp. 1-16, 2008. (JIF: 2.058)
  - “Detection of ST Segment Deviation Episodes in the ECG using KLT with an Ensemble Neural Classifier”, **Fayyaz Minhas** and M. Arif, in *Physiological Measurements* 29 (2008), pp. 747-760, 2008. (JIF: 2.058)
- **Preprints**
- **Fayyaz Minhas**, Amina Asif, Asa Ben-Hur. “Ten ways to fool the masses with machine learning.” *arXiv:1901.01686*, January 7, 2019.

- *Asif, Amina., Muhammad Dawood and **Fayyaz Minhas** "A generalized meta-loss function for distillation and learning using privileged information for classification and regression." arXiv preprint arXiv:1811.06885 (2018).*
- *Asif, Amina, Wajid Arshad Abbasi, Farzeen Munir, Asa Ben-Hur, and **Fayyaz Minhas**. "pyLEMMINGS: Large Margin Multiple Instance Classification and Ranking for Bioinformatics Applications." arXiv:1711.04913 [Cs, Stat], November 13, 2017.*

## ■ Conferences

### 2017

- Kanza Hamid, Amina Asif, Wajid Abbasi, Durre Sabih and **Fayyaz Minhas**, "Machine learning with abstention for automated liver disease diagnosis", in proc. 15<sup>th</sup> International Conference on Frontiers of Information Technology (FIT 2017), December 18-20, 2017, Islamabad, Pakistan.
- Fahad Hassan and **Fayyaz Minhas**, "Deep and self-taught learning for protein accessible surface area prediction", in proc. 15<sup>th</sup> International Conference on Frontiers of Information Technology (FIT 2017), December 18-20, 2017, Islamabad, Pakistan.
- "Protein Binding Affinity Prediction Using Support Vector Regression and Interfacial Features", Adiba Yaseen, Wajid A. Abbasi and **Fayyaz Minhas** in proc. 14th IEEE International Bhurban Conference on Applied Sciences and Technology (IBCAST), Islamabad, Pakistan, 9-13 Jan. 2017.
- Farzeen Munir, **Fayyaz Minhas**, Abdul Jalil and Moongu Jeon, "Real Time Eye Tracking using Kalman Extended Spatio-Temporal Context Learning", in proc. International conference on Pattern Recognition (<http://icopr.org/>), May 1-2, 2017, Singapore.

### 2015

- Wajid Abbasi and **Fayyaz Minhas**, "In Silico Prediction of Calmodulin Interactions", in proc. 3rd National Computational Science Conference (NCSC 2015), Institute of Space Technology, Islamabad, Pakistan (presentation only).

### 2013

- **Fayyaz Minhas**, Brian Geiss and Asa Ben-Hur, "*PAIRpred: Partner-Specific Prediction of Interacting Residues in Protein Complexes*", oral and poster presentation in 11th Annual Rocky Mountain Bioinformatics Conference, 2013, Aspen, Colorado USA.
- **Fayyaz Minhas**, Brian Geiss and Asa Ben-Hur "*PAIRpred: Partner-Specific Prediction of Interacting Residues in Protein Complexes*", poster presentation in Structural Bioinformatics and Computational Biophysics (3DSIG), July 19-20, 2013, Berlin, Germany.
- **Fayyaz Minhas**, Brian Geiss and Asa Ben-Hur, "*PAIRpred: Prediction of partner-specific interacting residues from sequence and structure*", oral presentation in Seventh International Workshop on Machine Learning in Systems Biology (MLSB13), July 19-20, 2013, Berlin, Germany.
- Corey Broeckling, **Fayyaz Minhas**, Asa Ben-Hur, Jessica Prenni, "*RAMClust: an unsupervised feature clustering method for non-targeted metabolomics datasets*", in 61st American Society for Mass Spectrometry (ASMS) Conference, June 9 - 13, 2013, Minneapolis, USA.

### 2012

- **Fayyaz Minhas** and Asa Ben-Hur, "*Multiple Instance Learning of Calmodulin Binding Sites*" in proceedings of 11th European conference on Computational Biology (ECCB) 2012, Basel, Switzerland, September 9-12, 2012.

### 2011

- "*Performance Comparison of Classifiers for Medical Image Segmentation with Transform and Moment Based Features*", A. Imdad, A. Jalil, **Fayyaz Minhas**, in proc. 8th International Bhurban Conference on Applied Science and Technology, Islamabad, Pakistan, Jan. 2011.

## 2010

- “*Prediction of Acute Hypotension Episodes in Patients Taking Pressor Medication using Modeling of Arterial Blood Pressure Waveform*”, **Fayyaz Minhas**, in proc 4th International Conference on Bioinformatics and Biomedical Engineering (ICBBE) 2010, Chengdu, China.
- “*Automatic Detection and Localization of Myocardial Infarction using Back-propagation Neural Networks*”, I. A. Malagore, **Fayyaz Minhas** and M. Arif, in proc. 4th International Conference on Bioinformatics and Biomedical Engineering (ICBBE) 2010, Chengdu, China.

## 2009

- “*Arrhythmia Beat Classification using Pruned Fuzzy K-Nearest Neighbor Classifier*”, M. Arif, **Fayyaz Minhas** and M. U. Akram in proc. International Conference on Soft Computing and Pattern Recognition (SoCPaR 2009), December 4-7<sup>th</sup>, 2009, Malacca, Malaysia.
- “*Wavelet Transform based Automatic Speaker Recognition*”, S. Malik and **Fayyaz Minhas**, in proc. 13th International Multitopic Conference (INMIC 2009), 14-15th Decemeber, 2009, Islamabad, Pakistan.
- “*A Comparison of Baseline Removal Algorithms for Electrocardiogram (ECG) based Automated Diagnosis of Coronary Heart Disease*”, **Fayyaz Minhas**, M. S. Riaz and M. Arif, in proc. 3rd International Conference on Bioinformatics & Biomedical Engineering (iCBBE-2009), Beijing, PR of China, June 11-13, 2009.
- “*Arif Index for Predicting the Classification Accuracy of Features and its Application in Heart Beat Classification Problem*”, M. Arif, **Fayyaz Minhas** , M. U. Akram, A. Fida, in proc. 13th Pacific-Asia Conference on Knowledge Discovery and Data Mining, 2009 (PAKDD 2009) April 27-30, 2009, Bangkok, Thailand.

## 2008

- “*A Pruned Fuzzy k-Nearest Neighbor Classifier with Application to Electrocardiogram based Cardiac Arrhythmia Recognition*”, **Fayyaz Minhas**, M. U. Akram, M. Arif, J. Khurshid, in proc. Intl. Multi-topic Conference (INMIC) 2008, Karachi, Pakistan, December 23-24, 2008.
- “*Person Identification based on Palm & Hand Geometry*”, Qaiser N. Ashraf and **Fayyaz Minhas**, presented at Doctoral Symposium on Computer Science, Lahore, Pakistan, August 9-10, 2008.
- “*Robust Classification of ECG Beats using Discrete Wavelet Transform & Principal Component Analysis*”, **Fayyaz Minhas**, and M. Arif, in proc. 2nd International Conference on Bioinformatics & Biomedical Engineering (iCBBE-2008), Shanghai, PR of China, May 16-18, 2008.

## 2007

- “*Detection of ST Segment Deviation Episodes in the ECG using KLT with an Ensemble Neural Classifier*”, **Fayyaz Minhas**, and M. Arif, in proc. IEEE International Conference on Emerging Technologies (ICET) 2007, Rawalpindi, Pakistan, 2007.
- “*QRS Detection & Delineation for ECG Based Robust Clinical Decision Support System Design*”, **Fayyaz Minhas**, and M. Arif, in proc. National Research Conference 2007, Lahore, Pakistan, 2007.

## 2006-2004

- “*Genetic Algorithm Based Path Planning and Optimization for Autonomous Mobile Robots with Morphological Preprocessing*”, **Fayyaz Minhas**, M. Arif, and M. Hussain, in proc. IEEE International Multitopic Conference (INMIC) 2006, Karachi, Pakistan, 2006.
- “*An Effective Approach to Fingerprint Segmentation using Fisher Basis*”, **Fayyaz Minhas**, M. Arif and M. Hussain, in proc. IEEE International Multitopic Conference (INMIC) 2005, Karachi, Pakistan, 2005.
- “*Wavelet Transform Based Global Features for Online Signature Recognition*”, **Fayyaz Minhas**, U. Farrukh and M. Arif, in proc. IEEE International Multitopic Conference (INMIC) 2005, Karachi, Pakistan, 2005.
- “*Development of a Minutiae Based Fingerprint Identification System*”, **Fayyaz Minhas**, M. Arif and M. Hussain, in proc. International Science Conference, Muzzaffarabad, Pakistan, Oct. 2004.
- “*Fingerprint Identification and Verification using Minutiae Matching*”, **Fayyaz Minhas**, M. Arif and M. Hussain, in proc. National Conference on Emerging Technologies, Karachi, Pakistan, 2004.
- “*Fingerprint Based Person Identification and Verification for Commercial Applications*”, **Fayyaz Minhas**, M. Arif, M. Hussain, in proc. IEEE International Multitopic Conference (INMIC) 2004, Lahore, Pakistan, 2004.

## ■ Patents

- Corey Broeckling, Jessica Prenni, Asa Ben-Hur and **Fayyaz Minhas**, RAMClust: Clustering of mass spectrometry features for identification, U.S. Provisional patent application, 2012.

- **Theses and Dissertation**

- **Fayyaz Minhas**, Large-margin methods for partner-specific prediction of protein interfaces, Ph.D. dissertation, Department of Computer Science, Colorado State University, Fort Collins, Colorado, USA, 2014.
- **Fayyaz Minhas**, Open Heart: ECG Based Cardiac Disease Analysis and Diagnosis System, MS (System Engineering) thesis, Pakistan Institute of Engineering and Applied Sciences, Islamabad, Pakistan, 2007.
- **Fayyaz Minhas**, Automatic Fingerprint Identification and Verification, BS (Computer and Information Sciences) thesis, Pakistan Institute of Engineering and Applied Sciences, Islamabad, Pakistan, 2005.