Curriculum Vitae

Anupam Purwar
Seniro Research Scientist, Amazon Development Centre India, Hyderabad
Leading multiple Data science and Machine Learning based Technical products for North America and Europe
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I. Education:

Specialization in Machine Learning: Google Cloud, 2019-20 (99/100), received 100% scholarship
MBA (Post graduate Programme in Management): Major in Finance and Information Systems, Indian School of Business, Hyderabad, 2018-19 (3.7/4)- Among Top 5% in class and recipient of 75% merit scholarship
Bachelor of Engineering: Mechanical Engineering (Distinction with Honors), Birla Institute of Technology & Science, Pilani (BITS Pilani), India, 2009-13 (9.44/10)-Top 5% in class, received 50% merit scholarship

II. Employment (Work Experience):

05/2019-Current: Senior Research Scientist, Amazon Development Centre India, Hyderabad
01/2014-12/2017: Research Scientist, Indian Institute of Science, Bangalore
07/2013-12/2016: Senior Systems Engineer, BrahMos Aerospace Pvt. Ltd.
01/2013-06/2013: Engineering intern, General Electric Company (JFWTC), Bangalore
05/2012-07/2012: Research Fellow, Indian Academy of Sciences, Bengaluru
05/2011-07/2011: Engineering intern, Tarapur Atomic Power Station, Boisar, Mumbai

III. Research Projects:

- **Amazon Global Fulfillment: Development of Large Language Model based chat bot**
  Leading development of technical architecture and augmented learning based language model (LLM) for retrieval Q&A and chain of thought questions, create metric to benchmark open source LLM performance
- **Amazon Global Fulfillment: Development of Non-Linear Optimization Model (1 Patent in progress)**
  Leading development of recommendation engine which solves nonlinear multi objective problem using Optimization and built the service to solve this NP-hard problem using parallel processing
- **Amazon Global Fulfillment: Development of Labour Planning Model (1 research paper)**
  Developed a non-linear optimization based technical product for Amazon facilities across North America and Europe to automate the planning of work at a site and network level with adoption across multiple orgs
- **Amazon Science: Maintenance Work Forecasting (1 research paper)**
  Developed multiple ARIMA, Deep-AR based forecasting model for Amazon facilities across North America to predict the maintenance work hours with adoption across 1000+ sites within 1 month of launch
- **Amazon Global Fulfillment: Development of Natural Language Processing based classifier**
  Developed a deep learning based classifier to analyze the feedback created by Amazon employees in facilities across North America to automate the interpretation of employee sentiment
- **Amazon Web Services:** Internal Consultant to AWS for building science based products/solutions
- **Indian School of Business: Development of Machine Learning based Forensic Auditing Tool**

Developed a technical product for analyzing Financial statements/annual reports of Firms using Natural Language Processing and ML-based techniques for Chief Economic Advisor, Govt. of India

- **Development of Ultra High Temperature Ceramics for Hypersonic Vehicle**s; sponsored by Center for Excellence in Hypersonic, Govt. of India, Grant amount: 344 lakhs, March 2014-December, 2016
  - Developed a new ceramic-metal composite with a melting point of 3000 deg C and reduced its material discovery time by from 10 years to 2 years by using Deep learning based techniques
  - Characterized the novel ultra high temperature ceramic-metal composite using Arc Jet Testing and high temperature Erosion facility in collaboration with ISRO, IIT-Kanpur and IIT-Roorkee
  - 10 peer reviewed research articles with Journal of American Ceramic Society, International Journal of Applied Ceramic Technology, Japanese Ceramic Society and Springer were published
- **Development of ultra high temperature instrumentation for temperature and pressure sensing:**
  - Designed and tested an IoT-enabled wireless sensor to measure temperature and pressure at up to 2500 degree Celsius and 200 bars pressure in collaboration with IIT Bombay
  - 2 peer reviewed research articles with Springer and IEEE Transactions were published

IV. Awards and Honors:

International Awards:

1. Lead author for a research article, it featured among most downloaded articles (top 5%) by Wiley, 2018
2. Outstanding Reviewer Award, Elsevier Publications, for Journal of Aerospace Science & Technology (top 10 percentile of reviewers), 2018
3. Outstanding Reviewer Award, Elsevier Publications, for Journal of Tribology (top 10 percentile of reviewers), 2017
4. International Design Award, ICorD-17, for designing critical components for India's first laser diagnostic equipped scramjet engine test facility, IISc Bangalore (http://www.iitg.ac.in/icord17/Merit.html)
5. Customer Excellence Award by Amazon Global VP for devising a new mode of transport for Amazon India Operations in less than 3 months, 2019 (Top 0.1% of employees)
6. Building Future Together by Amazon Global VP to recognise strategic initiatives which helped in driving long term goals of Amazon towards sustainability and efficiency, 2019 (Top 0.1% of employees)
7. Best Paper Award, Energy and Power category of IEEE International Conference, INDICON, 2015

National Awards:

1. Rockstar Award by Amazon India VP for creating pan-India Rail Transportation network for Amazon India in less than 12 months , 2020 (Top 0.5% of employees)
2. National Winner, Product Design, Centre for Product Design & Manufacturing, IISc, 2017 (for techno-commercial utility, 1/60 ideas)
3. Narotam Sekhsaria Scholar, Merit scholarship for MBA studies (Among top 0.1% of 12000 applicants)
4. Malaviya Award, Indian Ceramic Society, in recognition of best journal article in the area of ceramic science and technology, 2017, Awarded annually by 90-year old Indian Ceramic Society since 1974 to top technologists (Top 0.1% in India)

5. International Travel Grant Award, Science and Engineering Research Board (SERB) (to attend International Shock Wave Symposium, ISSW31), 2017
6. Best Product Idea Award, Centre for Product Design and Manufacturing, Indian Institute of Science,Bangalore, 2017
7. All India Rank-356, Graduate Aptitude Test in Engineering (GATE-Engineering Sciences, 2017)
8. Selected among top 10 innovations at Global Summit-London for developing smart control system to reduce electricity consumption
9. Won 2- IEEE best paper awards (top 1% articles) in INDICON 2015 and SCRTEEE 2012
10. Best product award, Technology Development Board, Govt. of India (20k seed fund
11. Reliance Dhirubhai Ambani Scholarship (for Master's studies at Stanford)-Finalist, 2016
12. Merit cum need Scholarship: Scholarship awarded by Birla Institute of Technology and Science, Pilani (BITS-Pilani) on basis of excellence in Bachelor's studies, 2011

V. Research Publications:

1. ARIMAX model for forecasting maintenance work (AMFM): A multi-stage seasonal ARIMAX model for work order time series forecasting- Accepted for CODE 2023
2. Will my startup get funding?: A Machine Learning Model to predict startup success, Accepted for CODE 2023
3. Automated Planning Tool: A nonlinear optimization based solver for work order scheduling, Consumer Science Summit, 2021 (Amazon sponsored Technical Conference)- Accepted for EURO2022
4. Effect of Different Root Canal Filling Materials in Endo-perio Lesions: Design and Computational Analysis, International Conference on Research into Design, ICoRD'21
5. Anupam Purwar, Customer Experience Management in Food and Beverage Outlet at Indian School of Business: Methodology and Recommendations, International Conference on Business Analytics and Intelligence (ICBAI), 20th - 22nd December, 2018, IIM Bangalore, Karnataka, India
6. Anupam Purwar, S. Hangal, A wireless sensor system for high temperature and heat flux measurement: Design, analysis and implementation, International Conference on Research into Design, ICoRD'19
7. Anupam Purwar, A multi-purpose sensor for heat flux and temperature measurement: Computational design and analysis, 14th IEEE India Council International Conference, INDICON, 2017
8. Anupam Purwar, Sneh Deep, A novel thermocouple for ultra high temperature application: Computational design and analysis, 2nd International Conference on Consumer Electronics Asia, ICCE Asia, 2017
9. Anupam Purwar, Jagadeesh Gopalan, Modeling of 3-DOF launch dynamics in transonic and supersonic regime using Navier Stokes Equation, International Shock Wave Symposium, ISSW31, 2017
10. Anupam Purwar, Thermo-structural design of hypersonic vehicle sharp leading edges for thermo-erosive stability using finite element modelling, International Shock Wave Symposium, ISSW31, 2017
11. Anupam Purwar, Ariharan S., Bikramjit Basu, BV Manoj Kumar, Thermo-erosive stability assessment of ZrB_2-SiC-Ti composites for hypersonic flight applications, International Journal of Applied Ceramic Technology, 2018

12. Anupam Purwar, T. Venkateswaran, Bikramjit Basu, Experimental and computational analysis of thermo-oxidative-structural stability of ZrB_2-SiC-Ti composite during Arc-jet testing, Journal of American Ceramic Society, 100 (10), 4860-4873 , 2017
13. Anupam Purwar, Thermo-structural design of strut based flame holder for scramjet combustor, Smart Innovation, Systems and Technologies, 65(1), Springer, 105-115, 2017
14. Anupam Purwar, Bikramjit Basu, Thermo-structural design of ZrB_2-SiC based thermal protection system for hypersonic space vehicles, Journal of American Ceramic Society, 100 (4), 1618-1633, 2017
15. Anupam Purwar, D. Roy Mahapatra, Design of Thermal Barrier coating system for Scramjet using Coupled Thermo-Structural analysis, Transactions of Indian Ceramic Society, Vol.75(4), 242-249, 2016
16. Anupam Purwar, Ravikumar K, Ariharan S., B.Basu; Development of ZrB_2-SiC-Ti by Multi Stage Spark Plasma Sintering at 1600°C, Journal of the Ceramic Society of Japan 124 (4), 393-402, 2016
17. Anupam Purwar, Divya Joshi, V.K. Chaubey, GPS Signal Jamming and Anti-jamming Strategy - A Theoretical Analysis, IEEE Explore, 2016
18. Anupam Purwar, Divya Joshi, M.S. Dasgupta, Smart Control of Electric Lamp using Artificial Intelligence based Controller, IEEE Explore, 2015
19. Anupam Purwar, D. Roy Mahapatra, A Methodology for coupled thermal structural analysis and structural design of Scramjet, 30th International Symposium on Shock Waves 1, Springer, 245-250, 2015
20. R Mukherjee, NK Gopinath, V Vignesh, A Purwar, DR Mahapatra, Thermal Analysis of Scramjet Combustor Panel with Active Cooling Using Cellular Materials, 30th International Symposium on Shock Waves 1, 239-244, 2015
21. Divya Joshi, Anupam Purwar, M.S. Dasgupta, Human detection based on explicit skin colour space thresholding and minor motion detection, IEEE Explore, 2014
22. Vikrant Bhakar, Anupam Purwar, Jakob Singer, Patricia Edege, Christoph Herrmann, Kuldip Singh Sangwan, Life Cycle Assessment of Lathe Processes for training application (A case study of an educational institute), International Conference on Management and Business Innovation, ICOMBI, 2013.

VI. Certifications:

- Coursera-Getting Started with AWS Machine Learning, certified by Amazon Web Services
- Coursera-Feature Engineering, certified by Google Cloud
- Coursera-Art and Science of Machine Learning, certified by Google Cloud
- Coursera-Managing Machine Learning Projects with Google Cloud, certified by Google Cloud
- Coursera-How Google does Machine Learning, certified by Google Cloud
- Coursera-Launching into Machine Learning, certified by Google Cloud
- Coursera-Introduction to TensorFlow, certified by Google Cloud
- Coursera-Sequence Models for Time Series and Natural Language Processing
- Coursera- “Introduction to high throughput materials development”,Georgia Institute of Technology
- Coursera- “Materials Data Science and Informatics”, Georgia Institute of Technology
- Coursera- “The Age of Sustainable Development”, Columbia University
- edX Certificate-“Next Generation of Infrastructure Systems”, TU Delft
- edX Certificate-“Leadership for Engineers”, TU Delft

VII. Oral presentations (in International Conferences):

- Development of a DSLR Camera Trigger Circuit for Use in Impulse Facilities, 14th IEEE India International Conference, INDICON, 2017
- Sustainability aspects in product customization for sybaritic value, SIG Emotional Engineering Workshop, ICoRD'17, IIT Guwahati, 2017
- Thermo-structural design of strut based flame-holder for scramjet combustor, 6th International Conference on Research into Design, ICoRD'17, IIT Guwahati, 2017
- Discussion Sessions on Design, Inclusive Manufacturing Forum, National Institute of Advanced Studies, Bengaluru, 2017
- Modelling of thermal barrier coating with transverse cracks using Finite Element Method, IUMRS-ICYRAM, Indian Institute of Science, Bengaluru, 2016

VIII. Extracurricular:

- Demo and Exhibit Chair, AIML Systems 2023
- Director, Graduate Student Board, Indian School of Business (2018-2019)
- Teacher, NoteBook Drive, IISc Bangalore: initiative to teach Maths, Science to underprivileged students (2016-2017 and 2019-2020)

IX. Skills:

- Machine Learning: Natural Language Processing, Neural Networks, Fuzzy Logic, Forecasting
- Operations Research: Solution of NP-Hard Problems, Goal programming, Multi-objective optimization
- Image Processing: Image segmentation, Pattern recognition, Feature extraction & filtering
- Python: Scikit-Learn, Keras, Pandas, Numpy, Matplotlib, NLTK, Statsmodel, Xpress, OpenCV
- Scanning Electron Microscopy (SEM), Energy dispersive X-ray spectroscopy (EDS),
- Computer-aided design (CAD): PTC Creo, AutoCAD Inventor, WindChill PLM, ANSYS
- Finite element analysis (FEA): ANSYS, HyperMesh; Computational fluid dynamics (CFD): Fluent, SU2

X. Voluntary services:

- Reviewer AIML-2023, IEEE Conference, 2023-Present (Reviewed 4 manuscripts)
- Reviewer AIML-2022, IEEE Conference, 2022-Present (Reviewed 4 manuscripts)
- Reviewer, Consumer Science Summit, Amazon, 2020-Present (Reviewed 10 manuscripts)
- Reviewer, Amazon Machine Learning Conference, 2020-Present (Reviewed 10 manuscripts)

XI. Advising and mentoring activities:

- Mentoring 12 employees (Data Scientist & Business Intelligence Engineers), Amazon Development Centre India, Bangalore
- Supervised 10 project assistants (Master's Thesis), IISc Bangalore