VYBHAV CHATURVEDI

EDUCATION

Year	Degree	Institute/ School	GPA/ %
2025-27	Post Graduate Diploma in Business Analytics	IIM Calcutta, ISI Kolkata, IIT Kharagpur	-
2017-22	B. Tech. (Computer Science) + M.B.A.	Thapar University, Punjab	7.8
2016	XII (CBSE)	Pt. Deen Dayal Upadhyay Vidyalaya	86.5 %
2014	X (CBSE)	St. Michael's Convent School	9.6
Key Skill/Tools	Inference, ML/DL (Pandas, NumPy, Scikit, PyTorch, TensorFlow), Docker, SQL, Git, LangChain, CrewAI, OpenAI		

WORK EXPERIENCE

ZS Associates — Associate Consultant – Products and Platform — Jan'22- Jul'25

Quantitative Modeling & Machine Learning	• Developed robust ETL pipelines (Python, SQL) for Pharma clients, boosting data & **operational efficiency by 8-20%** • Consolidated fragmented data across **10+ Excel & 15+ reports**, leveraging Power BI to **reduce analysis time by 90%** • Automated complex recurring reports using Pandas & Bash, saving **15 manual hrs/week** & ensuring data consistency • Engineered sequential recommendation engine using **RNNs** & **LSTMs** to model 20+ temporal features for 10+ clients
Data Engineering & Forecasting	• Applied **Monte Carlo simulation** & time series **(SARIMA)** to forecast **IC payouts**, **managing plans for ~20 clients** • Designed a statistical framework to monitor key BD metrics, utilizing **anomaly detection** to **identify revenue drivers** • **Supported 50+** Emerging Pharma clients, enabling successful product launches & robust commercialization strategies
Technical Leadership & Delivery	• Led a **4-associate team**, delivering quantitative analysis to inform the steering committee's **GTM expansion strategy** • **Supported 80 clients** by fostering collaboration across Technology, Product, Marketing, Ops, Sales & Leadership team • Translated complex **technical** data insights into actionable business recommendations for senior leadership and clients
Tooling & Automation	• Built a **scalable** "Case Study Finder" app with **Streamlit & AWS (EC2, S3),** reducing stakeholder search time by 40% • Pioneered an analytics dashboard tracking **critical** asset KPIs **(CTR, Reach, ROI)** to enable data-driven optimization

RESEARCH CONTRIBUTIONS

Publication	• Architected a **robust multi-modal** ML model **mapping 37 moods to 8 human emotions**, achieving **81.4% accuracy** • Conducted rigorous comparative statistical analysis of **11 regressors and 4 classifiers** to optimize final model selection • Engineered data pipeline integrating **4 high dim bio-signals** (EEG, ECG) to train & evaluate all model performance • Published the **novel research** in "Multimedia Tools and Applications, Springer" leading peer-reviewed journal **(IF -3.5)** • Granted Patent (2021101097) for an **innovative emotion-driven playlist generator** using real-time bio-signal streams
Publication	• Systematic review of music mood & human emotion recognition published in "Multimedia Systems, Springer" **(IF -3.3)** • Analyzed ML models **comparing F1-score & ROC-AUC** for classifying emotions from biosignals (EEG, ECG, GSR) • **Investigated 30+ datasets** & corresponding feature extraction techniques for bio-signal processing and mood analysis • **Identified key research gaps** in current literature to guide robust future model development in multi-modal mapping

PROJECTS

Cuckoo.ai – Agentic AI & RAG Framework	▪ Architected a multi-agent LLM system (LangChain & GPT-4), orchestrating **6 agents** to reduce evaluation time by 87% ▪ RAG pipeline with FAISS & OpenAI vectors, enabling rapid search across 10k reports to eliminate **85% redundancies** ▪ Implemented **high-concurrency** async agent execution, processing 24+ sources parallelly to cut synthesis **time by 90%** ▪ Delivered **3× throughput increase** while reducing evaluation costs by ~70%, delivering 100% audit-traceable outputs ▪ Deployed **scalable** end-to-end solution (FastAPI & Streamlit) via Docker on AWS, establishing **robust** CI/CD pipeline
Financial Forecasting – Econometrics Modeling	▪ Constructed **SARIMA** model on stationary series (ADF $p<0.001$), minimizing 24-month forecast error **(RMSE=0.253)** ▪ Architected **3-model stacked ensemble** with Ridge regularization **(α=1.0)**, reducing error by **21%** via bias correction ▪ Modeled **recursive LSTM** with 12-month lookback, identifying seasonal autocorrelation **via lag perturbation analysis** ▪ Devised Meta Learner on optimized weights (SLSQP optimization), outperformed SARIMA & LSTM **(RMSE=0.203)** ▪ Evaluated model complementarity across 7 distinct ensembles **validating** the meta-learner's robust **21%** RMSE increase
Decoding Depression Networks (GSE54564)	▪ Benchmarked supervised ensemble models yielding **acc**. (<60%), pivoting to unsupervised Consensus Clustering **(k=4)** ▪ **Reduced** noise & **scaled down** dimensionality by **89%** achieving high stability **(CCC: 0.94)** & separation **(PAC: 0.36)** ▪ Engineered **WGCNA pipeline on 20k features**, isolating **8 distinct module** with scale-free topology (R^2**>0.85,** β **= 6**) ▪ Performed **Chi-square test (5.04)** to identify and validate MDD enriched subtype in the database for subtype-diagnosis ▪ Applied robust **LTS regression** for **cell-type deconvolution** to quantify significant shift (**p<0.05**) in **Microglial** count ▪ **Characterized** significant cellular shifts detecting inhibitory neuron (d<-0.63) against endothelial enrichment (d>+0.64)
Multi-modal Bio-Signal Classification using Emotion	▪ Architected **3-phase affective computing** pipeline correlating & dynamically map emotions to song mood using signal ▪ **Engineered 6k+ audio features** (spectral, temporal) to train Random Forest, **achieving 81.4% accuracy** in 37 classes ▪ Built real-time data ingestion pipeline integrating EEG & ECG bio-signal for **concurrent** human emotion classification ▪ Validated multi-modal bio-signal fusion using **ANOVA**, confirming significant **improvement** over uni-modal baselines

COMPETITIONS

SLoP	• Secured **1st place** in the National Semester Long Project (SLoP) by DA-IICT, winning by a wide margin of 200 points
SWoC	• **National Runner-up** – Script Winter of Code, actively contributed to 5 open-source projects (22 Pull Request merged)

POSITIONS OF RESPONSIBILITY

Mentor – GSSOC	• **Mentored 10+ participants** in GirlScript Summer of Code, reviewed & approved 40+ PRs & helped new contributors
ML Fellow	• Selected for the **fellowship.ai 2022 cohort**; steered piano performance **evaluation using MIDI features(F1– 96%)**

ACHIEVEMENTS

Research Impact	• Achieved **100+ citations** in high-impact journals, establishing technical authority in **Multi-modal Machine Learning**
ZS Annual Award	• Awarded **'Engagement Champion'** for bridging technical-business silos to translate insights into executive strategy
Beyond the Mile	• **Won 10+ 'Going Beyond the Mile' awards** for innovative problem-solving, developing novel PoCs & automations

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