

S M Sultan Mahmud Rahat

Founder & CEO, Avos AI · 3x Founder · Applied AI Researcher

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[LinkedIn](#) [Google Scholar](#) [GitHub](#)

PROFILE

Founder & CEO of Avos AI and an applied AI researcher. Three-time founder with a track record across education, manufacturing, and applied R&D: 500+ customers served, \$500K+ revenue generated, five peer-reviewed publications (485 citations), and a multimodal memory for AI agents reaching 82.44% average Recall@5 on MSR-VTT in our testing.

EXPERIENCE

Avos AI

Jul 2025 to Present · San Francisco, CA

Founder & CEO

- Building an operating system for trillions of AI agents: the context, memory, encryption, and control plane for connectivity, trust, auditability, and cross-context control.
- Built a multimodal memory for AI agents, reaching 82.44% average Recall@5 on MSR-VTT in our testing (97.08% text/audio, 77.86% image, 71.75% video).
- Created avos-dev-cli, an open-source Git-aware memory layer for AI coding agents such as Claude Code, Cursor, and Codex.

Avos Lab (Research & Development)

Jan 2020 to Feb 2022 · Dhaka, Bangladesh

Head of R&D

- Built and lead an applied research lab of seven, including two professors and graduate researchers, in collaboration with University of Dhaka, Uttara University, and private institutions.
- Output: five peer-reviewed publications, 485 citations (h-index 5), and a pending machine-learning patent (DPDT 12FEB9B1), with a second in preparation.
- Research across energy storage (supercapacitors) and machine learning for industrial prediction.

Avos (Avos LTD)

Oct 2017 to Present · Bangladesh

Co-founder & Owner

- Textile manufacturing and exports: scaled from a single room to a \$100K+ business, exporting to five-plus countries.
- Led production, operations, supply chain, hiring, and client delivery.

Exponential Academic Care

Feb 2014 to Jul 2016 · Bangladesh

Founder & Tutor

- Founded and ran an education-services company, serving 500+ students.
- Bootstrapped from \$25 to a company valued close to \$100,000.

Miskin Fund (Charity Foundation)

Jan 2009 to Dec 2013 · Bangladesh

Founder

- Founded and ran a community charity foundation.

ACHIEVEMENTS

- Building Avos AI, an AI company in Silicon Valley developing the memory and control plane for AI agents.
- Multimodal memory for AI agents: 82.44% average Recall@5 on MSR-VTT in our testing (97.08% text/audio, 77.86% image, 71.75% video).
- Created avos-dev-cli, an open-source Git-aware memory layer for AI coding agents (Claude Code, Cursor, Codex).
- Built a company-backed R&D lab (seven researchers, including two professors; collaborations with University of Dhaka and Uttara University) producing 5 publications, 485 citations, and a pending patent.
- Three-time founder; generated \$500K+ in revenue across ventures.
- Bootstrapped a company from \$25 to a valuation close to \$100,000.
- First venture (education) helped 500+ students reach their goals.
- Developed a fuzzy-ML system predicting fabric GSM and shrinkage on 12G flatbed knitting machines, cutting sample-stage time and cost.
- Developing a novel cotton fabric with controlled air permeability and thermal conductivity.
- Organized the 1st Bangladesh Chem Carnival (ACS Student Chapter).

SELECTED PROJECTS

Git-Aware Coding Agent: Avos CLI for persistent, queryable repository memory for AI coding agents
(PR/commit/issue-aware reasoning with automatic git-hook sync) · [GitHub](#)

Benchmarking AI Agents for Web Navigation in Software Engineering · [GitHub](#) · [Report](#)

Predicting 30-Day Readmission Risk for Diabetic Hospital Patients · [GitHub](#) · [Report](#)

Deep Learning Time Series: probabilistic deep-learning architectures for multivariate time-series forecasting · [GitHub](#) · [Report](#)

Best Home Regions: data-driven identification of attractive U.S. real-estate investment areas using unsupervised and supervised machine learning · [GitHub](#)

Cloud-deployable movie & streaming data pipeline with MySQL integration and preprocessed Kaggle/IMDb datasets · [GitHub](#) · [Presentation](#)

Data pipeline and modeling workflow for AWS Athena: EDA, training-data prep, and acquisition via APIs and scraping · [GitHub](#)

Python-based local multi-agent system for querying documentation and generating code (LlamaParse + Ollama) · [GitHub](#)

Exploring mental health discourse on Reddit: sentiment analysis and topic modeling for r/MentalHealth and r/MentalHealthSupport · [GitHub](#)

Retail Analytics: understanding customer behavior through transaction data · [GitHub](#) · [Report](#)

Relationship between carbon dioxide emissions and vehicle characteristics · [GitHub](#) · [Report](#)

Loan Approval Prediction: a machine-learning system for automated banking decisions · [GitHub](#) · [Report](#)

Image recognition for AliExpress price prediction: CNN/ANN image classification and NLP price prediction with web scraping (Fashion-MNIST + AliExpress) · [GitHub](#) · [Report](#)

Best Region to Buy Homes for Investment: a composite-score real-estate analyzer using regional clustering and financial metrics · [GitHub](#) · [Presentation](#)

PUBLICATIONS & PATENTS

Sakib, M.N.*, Ahmed, S.*, Rahat, S.M.S.M.*, Shuchi, S.B. (2021). A review of recent advances in manganese-based supercapacitors. *Journal of Energy Storage*, 44, 103322. (IF 6.6, Q1)

Malik, M.T.U.*, Sarker, A.*, Rahat, S.M.S.M.*, Shuchi, S.B. (2021). Performance enhancement of graphene/GO/rGO based supercapacitors: A comparative review. *Materials Today Communications*, 28, 102685. (IF 3.4, Q2)

Heme, H.N.*, Alif, M.S.N.*, Rahat, S.M.S.M.*, Shuchi, S.B. (2021). Recent progress in polyaniline composites for high-capacity energy storage: A review. *Journal of Energy Storage*, 42, 103018. (IF 6.6, Q1)

Banik, U., Uddin Malik, M.T., Sultan Mahmud Rahat, S.M., Mallik, A.K. (2022). Performance enhancement of ruthenium-based supercapacitors: A review. *Energy Storage*, 5(3), e380.

Rahat, S.S.M., Hasan, K.M.Z., Mondol, M.M.H., Mallik, A.K. (2023). A comprehensive review of carbon nanotube-based metal oxide nanocomposites for supercapacitors. *Journal of Energy Storage*, 73, 108847.

* Co-first authors. Citations and h-index via Google Scholar.

In progress: Rahat, S.M.S.M., Islam, S., Khan, M.H.K., Bakar, A. Prognosis of widthwise and lengthwise shrinkage and mass per unit area of knitted fabric with fuzzy logic analysis. (In preparation)

PATENTS

- A device with organized data to predict fabric GSM and lengthwise/widthwise shrinkage on a 12G flatbed knitting machine using a fuzzy inference system. (File ID 60, Tracking 12FEB9B1; DPDT, Bangladesh)
- A novel fabrication of single-jersey knitted fabrics by a 12-gauge flat-bed machine. (Patent article, in preparation)

485+ citations across peer-reviewed work (Google Scholar).

EDUCATION

M.Sc., Applied Data Science

CGPA 3.89 / 4.00 · 2024

University of San Diego

B.Sc., Applied Chemistry & Chemical Engineering

University of Dhaka

Higher Secondary Certificate, Science

GPA 5.00 / 5.00 · 2013

SOS Hermann Gmeiner College

Secondary School Certificate, Science

GPA 5.00 / 5.00 · 2011

SOS Hermann Gmeiner College

STANFORD AI & CS COURSEWORK

In-person audited courses, Stanford University (Feb 2022 to May 2025)

CS161 Design & Analysis of Algorithms

CS25 Transformers United V5

CS106AX Programming Methodologies (JS & Python)

CS106B Programming Abstractions

CS107 Computer Organization & Systems

CS224U Natural Language Understanding

CS224N NLP with Deep Learning

CS229S Systems for Machine Learning

CS330 Deep Multi-task & Meta-Learning

CS224V Conversational Virtual Assistants

CS224R Deep Reinforcement Learning

CS224S Spoken Language Processing

CS329A Self-Improving AI Agents

CS329S Machine Learning Systems Design

CS336 Language Modeling from Scratch

CS349D Compound AI Systems

CS372 AI for Reasoning, Planning & Decision Making

SKILLS

Programming: Python, C++, JavaScript, SQL / NoSQL / PostgreSQL, R

AI / ML:

PyTorch, TensorFlow, LangChain; deep learning, transformers, NLP, RL, ML systems, multimodal retrieval, RAG, ANN, fuzzy logic

Research & Analytical:

Nanocomposite synthesis (sol-gel, Hummer's method); UV-Vis, BET, XRD, FTIR, SEM; reaction kinetics

Engineering Tools: MATLAB, Aspen HYSYS, AutoCAD, LaTeX, MS Office

ADDITIONAL

- Industrial training across fertilizer, cement, glass, paper, and gas plants in Bangladesh, including Shahjalal Fertilizer Factory (2019).
- Chemical plant design: 1000 MT/day coal-based urea plant (Prof. Dr. Mohammad Nurnabi).
- Organized the 1st Bangladesh Chem Carnival (ACS Student Chapter); Organizing Secretary, Cultural Club, ACCE.