KARAN PRATAP SINGH

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EDUCATION

Georgia State University – Presidential Scholar (Full-Ride Merit Scholarship)
Bachelor of Science in Computer Science | GPA: 4.20 / 4.3 | Expected Graduation: 2028 | Atlanta, GA

WORK EXPERIENCE

SPUR Research Scholar / Intern — Carnegie Mellon University *May 2026 – Present*

- Applying Zero-Knowledge Proofs and Secure Multi-Party Computation to build privacy-preserving ID-verification protocols that authenticate credentials without exposing personally identifiable information.
- Engineered privacy-preserving computation pipelines using Secure Multi-Party Computation, optimizing circuit design for correctness and efficiency across distributed data sources with no trusted intermediary.
- Researching cryptographic proof-binding to real image provenance (C2PA-style) to create tamper-evident verification systems.

Founding Engineer & AI/ML Lead — Stockd, Georgia Tech CreateX Launch *February 2026 –Present*

- Architected an end-to-end ML forecasting pipeline (time-series regression with seasonality adjustments and trend detection) achieving 13% MAPE, enabling 20–40% reductions in food waste for pilot restaurant clients.
- Built a dynamic pricing engine and real-time analytics dashboard driving 10–15% peak-period revenue uplift and measurable improvement in profit margins.
- Secured funding through Georgia Tech's CreateX Launch program

Undergraduate Research Assistant — Data Engineering Lab (DELab), GSU *January 2026 – April 2026*

- Researching graph coarsening methods using NetworkX, designing and evaluating node aggregation algorithms that reduce graph complexity while preserving structural properties for downstream graph mining tasks.
- Implementing and benchmarking node-level coarsening techniques on real-world graph datasets, analyzing how different aggregation strategies affect node feature retention and graph topology under varying sparsity conditions.

PROJECTS

Vertex A11y – Chrome Accessibility Extension (HackGT 12 Emerging Track Winner)

- Built a Chrome extension that automatically detects 15+ categories of ADA/WCAG accessibility violations across 500+ test pages, reducing manual audit time by 75% through automated HTML/CSS/JS scanning.
- Integrated OpenAI API to generate granular compliance scores (A/AA/AAA ratings) per page, enabling developers to triage issues by severity and achieve 40% faster remediation cycles.
- Won Emerging Track at Georgia Tech's HackGT 12 among 1,500+ participants.

LEGR – Autonomous Finance Agents for Startups (Best Business & Enterprise Hack —HackPrinceton Spring '26)

- Built a fleet of autonomous AI finance agents that handle startup financial operations end-to-end — deployed via iMessage through Photon, eliminating the need for manual finance tooling.
- Built around a stateless vs. long-running architectural split on Dedalus: short-lived agent calls for pure functions (compliance scoring, spend audits) and persistent Dedalus Machines for multi-day negotiation processes.
- **AI Spend Optimization agent** audits LLM API usage to catch wrong-model routing (e.g., 31K Opus calls that should have been Haiku, saving $2,840/mo), idle credits, and forgotten batch jobs automatically.
- **Expense Compliance agent** scores every card transaction against company policy with confidence scores — silent when clean, alerting when something is off.

TECHNICAL SKILLS

Programming Languages: Python, JavaScript, HTML/CSS, PostgreSQL, C++ (Learning)
Libraries & Tools: NumPy, Pandas, scikit-learn, PyTorch, FastAPI, Git, Linux, NLP
Quantitative & Research: Statistical Modeling, Exploratory Data Analysis, Algorithmic Problem Solving, Applied Cryptography, Secure Computation.