Tolga Bilgis

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Education

Clemson University Clemson, SC
B.S. in Computer Engineering, Minor in Mathematical Sciences | GPA: 3.9/4.0 *May 2028*

Technical Skills

Languages: Python, Bash, C, C++, Go, SQL, JavaScript
Systems & Networking: Linux Administration, systemd, TCP/IP, DNS, HTTP/TLS, SSH, NFS
Cloud & Containers: AWS (EC2, VPC, IAM, S3), Kubernetes, Docker, Podman, Helm
Automation & Delivery: Ansible, Terraform, cloud-init, Git, GitHub Actions, GitLab CI/CD, Argo CD
Observability: Prometheus, Grafana, Alertmanager
HPC: Slurm, MPI, OpenMP, InfiniBand/RDMA, Spack

Experience

High Performance Computing (HPC) Intern – AI Infrastructure May 2026 – Aug. 2026
Los Alamos National Laboratory *Los Alamos, NM*

- Built a 10-node stateless HPC cluster with Slurm, automating provisioning with cloud-init and Ansible.
- Automated stateless HPC boot-image builds with GitLab CI/CD.
- Built a retrieval-augmented generation (RAG) system for 2 TB of scientific PDFs.
- Benchmarked five vector databases on 2.7M 4,096-dimensional embeddings for RAG retrieval.
- Selected and integrated a retrieval backend with 20× higher throughput than prior solution.
- Published a peer-reviewed research poster accepted for presentation at the SC26 Supercomputing Conference.

HPC System Administrator Dec. 2024 – Present
Clemson University – High-Performance Cluster Computing Creative Inquiry *Clemson, SC*

- Serve as system administrator for Clemson's student HPC team and cluster with eight NVIDIA A100 GPUs.
- Competed in the international SC25 Student Cluster Competition; returning for SC26.
- Co-built and administered an eight-A100 HPC cluster, tuning performance across distributed workloads.
- Evaluated published distributed graph algorithms on three nodes, analyzing scaling and tuning communication.
- Co-authored SC25 reproducibility paper comparing results with the original study and identifying bottlenecks.
- Built a 16-node Raspberry Pi cluster for the Single Board Cluster Competition (SBCC).

AI Coding/Math Expert Jan. 2024 – Jan. 2026
Outlier AI *Remote, Contract*

- Evaluated AI-generated code and math solutions for correctness, identifying logic errors and flawed reasoning.
- Wrote and tested reference solutions in C++, Python, Java, Kotlin, and JavaScript to improve model responses.

Projects

Linux & Kubernetes Homelab | *Kubernetes, Ansible, GitHub Actions, Argo CD* Jul. 2026

- Built a three-node Kubernetes cluster with highly available control-plane services and replicated storage.
- Automated Linux host configuration and cluster provisioning with Ansible.
- Built GitOps pipelines with image testing, digest-pinned releases, and Argo CD deployments.
- Deployed Prometheus, Grafana, and alerts to track service health and resource usage.
- Tested node failures and backup restores, measuring recovery time and verifying data integrity.

Distributed Edge AI Theft Detection | *NVIDIA Jetson, Docker, YOLO* Feb. 2026

- Built a distributed theft detection system on two NVIDIA Jetsons during the 24-hour CUHackit hackathon.
- Split object detection and facial recognition across nodes, displaying theft alerts to a web dashboard.
- Deployed YOLO inference in Docker with NVIDIA GPU access and a reusable container launch script.
- Earned 2nd Place for Best Use of Hardware.

NetProbe – TCP Benchmarking Tool | *C, Linux, POSIX Sockets* Aug. 2026

- Built a TCP client/server tool in C to measure round-trip latency and throughput between Linux hosts.
- Implemented monotonic-clock timing and socket I/O loops handling partial transfers and interrupted system calls.
- Automated unit, CLI, and client/server integration tests with GitHub Actions; tested across two homelab nodes.