Final Internship Report

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I. Overview:
The final week of the internship was focused on deployment, collaboration with stakeholders, and wrapping up the project deliverables. Efforts were dedicated to making the hybrid forecasting model production-ready, finalizing the cloud-hosted dashboard, and ensuring scalability for broader adoption. **II. Achievements:**
1. Cloud Deployment:
- Successfully deployed the hybrid forecasting model on a cloud platform with containerization support.
- Ensured 24/7 accessibility of the dashboard to stakeholders via secure login.
- Implemented auto-scaling to handle peak traffic loads.

2. Enhanced Event Modeling:
- Developed weighted event features considering severity, duration, and crowd size.
- Achieved further improvement in forecast accuracy (~3% RMSE reduction).
- Validated results using past city events (sports tournaments, rallies, festivals).

3. Collaboration & Feedback:
- Conducted demo sessions with city traffic authorities and urban planning teams.
- Collected structured feedback and refined the dashboard interface for usability.
- Added summary reports export (PDF/CSV) for planners' decision-making.

III. Challenges:
1. Model Interpretability:
- Hybrid models were accurate but challenging to explain to non-technical stakeholders.
- Addressed this by integrating visual interpretability graphs (e.g., feature importance and event impact plots).

2. Deployment Costs:
- Cloud hosting and auto-scaling increased operational costs.
- Suggested phased deployment, starting with high-priority junctions.

IV. Learning Resources:
- Gained practical exposure to cloud deployment (AWS/GCP) and container orchestration (Kubernetes).
- Reviewed best practices in MLOps for continuous monitoring and retraining of traffic forecasting models.
- Learned visualization strategies for communicating AI/ML results effectively.

V. Final Outcomes:
- A fully functional, real-time, cloud-hosted smart city traffic forecasting system.
- Hybrid forecasting pipeline (Prophet + LSTM) integrated with event-aware features.
- User-friendly dashboard with live maps, congestion alerts, event overlays, and report export functionality.

VI. Conclusion:
The internship provided hands-on experience in developing, deploying, and scaling a real-world AI-based traffic forecasting system. The final solution demonstrated measurable accuracy improvements, real-time usability, and practical value for urban traffic management. This internship

significantly enhanced both technical and collaborative skills, preparing me for future contributions in AI-driven smart city solutions.