Internship Final Report

Beginner Level

Student Name: Mahasweta Talik

University: Kalinga Institute of Industrial Technology

Major: Computer science

Internship Duration: August 1st, 2025 - August 31st, 2025

Internship Company: ShadowFox

Domain: AI/ML

Mentor: Kalai Maha

Coordinator: Mr. Aakash

Objectives

The primary goals I set for this internship were:

1. To build a strong foundation in data science methodologies and real-world practices.
2. To gain hands-on experience in data analysis, statistical modeling, and visualization techniques.
3. To sharpen my ability to extract meaningful insights from complex datasets using modern data science tools.

Tasks and Responsibilities

During my internship at ShadowFox, I actively contributed to the development of a context-aware auto-correct keyboard system. My key responsibilities included:

- **Language Modeling and Research:**
  Explored and implemented statistical and neural approaches for next-word prediction. This involved building baseline n-gram models and experimenting with Recurrent Neural Networks (RNNs) to capture contextual dependencies in user input.

- **Data Collection and Preprocessing:**
  Curated and cleaned large-scale text datasets to train predictive models. Applied tokenization, normalization, and sequence padding techniques to prepare data for model ingestion.

- **Model Development and Evaluation:**
  Designed and trained predictive models using Python and libraries such as TensorFlow and Keras. Evaluated model performance using metrics like perplexity, accuracy, and top-k prediction success rates.

- **Auto-correct Logic Integration:**
  Developed algorithms to detect and correct spelling errors in real-time. Integrated auto-correct functionality with the predictive model to enhance typing accuracy and fluidity.

- **Keyboard Interface Simulation:**
  Simulated a keyboard interface to test real-time word suggestions and auto-correct behavior. Ensured smooth interaction between the frontend input and backend prediction engine.

- **Performance Optimization:**
  Tuned model parameters and optimized inference speed to ensure the system could run efficiently on mobile devices without compromising accuracy.

- **Documentation and Reporting:**
  Maintained detailed documentation of model architecture, training workflows, and evaluation results. Compiled technical reports summarizing project milestones, challenges, and outcomes.

Learning Outcomes

This internship provided a transformative learning experience, resulting in:

- **Technical Mastery:**
  Gained proficiency in data science workflows, including data wrangling, statistical analysis, machine learning, and visualization.
- **Process Understanding:**
  Developed a comprehensive view of the data science lifecycle—from data acquisition and preprocessing to model deployment and interpretation.
- **Analytical Thinking:**
  Strengthened my ability to dissect complex datasets, uncover actionable insights, and apply appropriate analytical techniques to solve real-world problems.
- **Professional Growth:**
  Improved my communication skills, teamwork, and time management in a fast-paced, collaborative environment.

Challenges and Solutions

1. **Managing Large Datasets:**
   Faced performance bottlenecks while working with high-volume data. I optimized workflows using efficient data structures and parallel processing techniques to reduce computation time.

2. **Model Validation and Accuracy:**
   Ensuring robust model performance was a challenge. I addressed this by applying cross-validation, tuning hyperparameters, and iteratively refining models based on evaluation metrics

Conclusion

My internship at ShadowFox was a pivotal step in my journey as a data science professional. The exposure to real-world datasets, advanced modeling techniques, and collaborative problem-solving has deepened my passion for the field. This experience has equipped me with the confidence and competence to pursue impactful roles in data science and analytics.

Acknowledgments