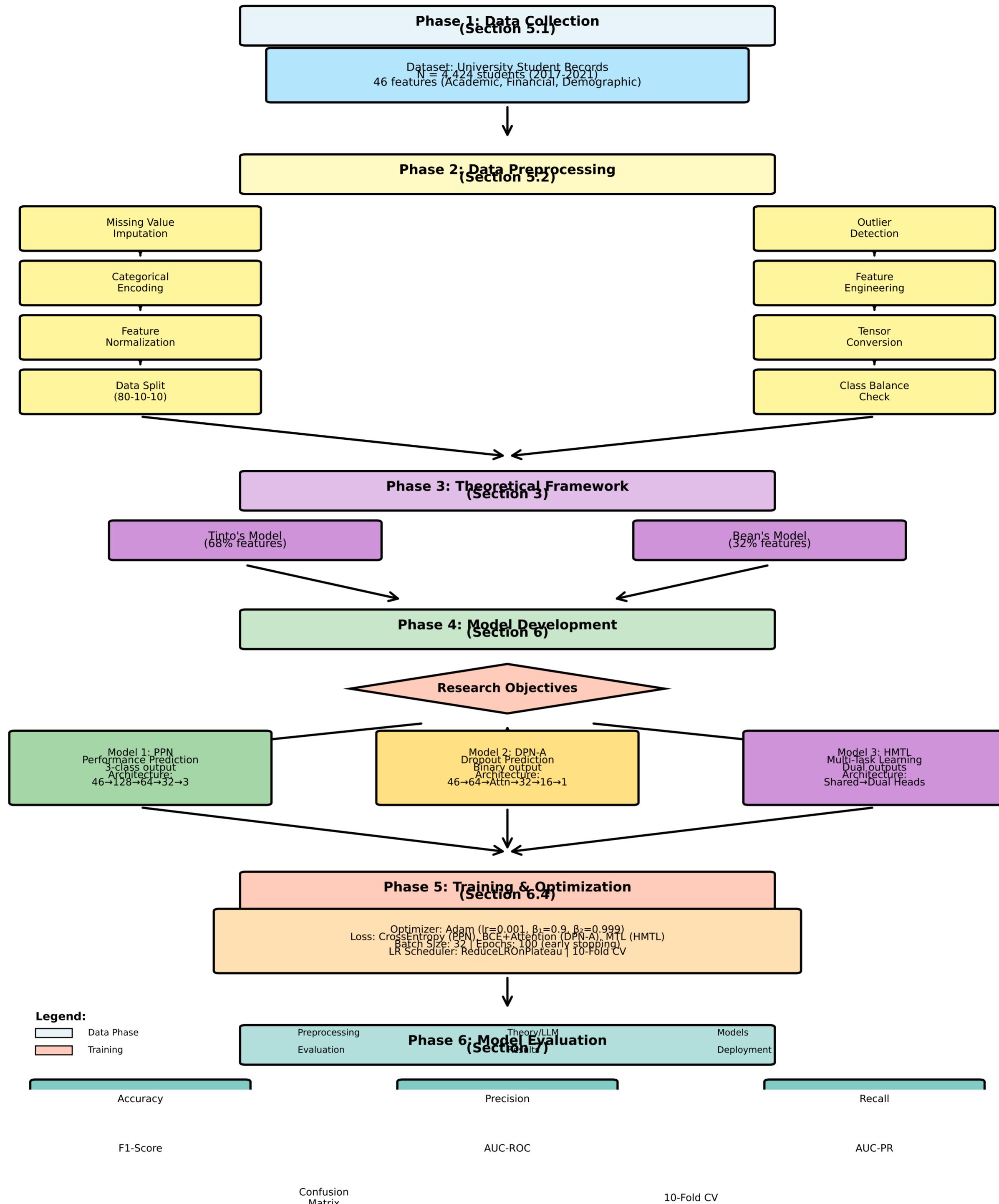


Research Methodology Flowchart

Deep Learning + LLM for Student Performance & Dropout Prediction



Phase 7: Results & Analysis (Section 10)

PPN Results
Accuracy: 76.4%
Macro F1: 0.764

DPN-A Results
Accuracy: 87.05%
AUC-ROC: 0.910

HMTL Results
Perf: 76.4%
Drop: 67.9%

Phase 8: LLM Integration & Recommendations
GPT-4 generates personalized interventions
Rule-based + AI-powered student support

Phase 9: Deployment & Early Warning System
Institutional Integration with advisor dashboard
Real-time risk monitoring & intervention tracking