**Project Proposal for Intelletic Trading Systems LLC**

**Title: Brain‑Inspired AI with Reinforcement Learning for** **Real-World Actions**

**Background**:

Intelletic Trading Systems LLC is a private fintech startup headquartered in Chicago, with shareholders dispersed across North America. The company prides itself on its proprietary artificial intelligence (AI) that emulates the human neocortex, designed to forecast price movements. This unique AI facilitates the trading of an expansive portfolio, encompassing up to 800 financial assets across seven distinct asset classes. Over the years, Intelletic has achieved significant milestones, including the successful development of a profitable trading platform, and is one of only a few companies to secure a license for Numenta’s cortical learning algorithms.

With financial markets growing ever more competitive, Intelletic is looking to push beyond simple predictions. The next challenge is to build fully autonomous systems using Numenta’s technology. Integrating Numenta’s Hierarchical Temporal Memory (HTM) technology with modern reinforcement learning methods promises an adaptive trading engine capable of autonomously executing trades and managing risk in real time. This can be used as the first test-bed for a fully autonomous system.

**Project Objective**:

The primary objective of this project is to design and implement a brain-inspired AI that combines Numenta’s cortical learning algorithm (Hierarchical Temporal Memory) with reinforcement learning to enable it to take real-world actions. Forecasting stock price and make trades is one such lucrative application. The system should ingest and process market data, generate predictions, decide on trades, and learn from the outcomes to improve future performance. The completed platform will be back‑tested on historical market data and, if possible, evaluated with live data to demonstrate its viability.

**Deliverables**:

1. **Stock Trading System**: An end‑to‑end trading platform that uses HTM for predictive modeling and reinforcement learning for decision making. The system should include data ingestion, model training, back‑testing and simulated trade execution components.
2. **Performance Evaluation**: A report comparing the system’s results to relevant baselines in domains other than stock trading and documenting the impact of combining HTM predictions with reinforcement learning.

**Expectations of the Team**:

This project offers a chance to explore cutting‑edge brain‑inspired AI and reinforcement learning in the context of financial markets. Team members should have solid Python programming skills and an interest in machine learning. Familiarity with reinforcement learning algorithms, time‑series modeling or Numenta’s HTM will be valuable. An enthusiasm for quantitative finance will also aid in understanding market dynamics and evaluating trading strategies.