Novel Synergization of Lunar Chronobiology, Genotypic Stress Analysis, and CNN-LSTM Architectures for Hyper-Localized Climate-Adaptive Agricultural Planning

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Climate volatility remains a primary obstacle to global food security, subjecting 500 million subsistence farmers to catastrophic financial losses due to the disconnect between traditional planting calendars and modern stochastic weather patterns. To address this, an advanced decision support system replaces static agricultural planning with a high-dimensional hybrid Deep Learning architecture. This technology functions as a successor to the traditional farmers almanac, augmenting agricultural precision by filtering climatic noise through a custom CNN-LSTM model. The Convolutional Neural Network layers extract spatial features from satellite telemetry while the Long Short-Term Memory layers process temporal phenological dependencies. This architecture is uniquely modified with a Lunar Embedding layer that integrates gravitational and illumination vectors to synchronize biological vigor with astronomical cycles. Most notably, the project re-engineered the Conditional Value at Risk metric from a passive financial assessment into an active predictive climate engine. By shifting from standard averages to a tail-risk analysis, the modified CVaR quantifies the probability of aggregated critical failure in the most volatile climate scenarios, allowing the system to forecast resilient planting dates and potential earnings. This technical shift demonstrates a significant improvement in precision over traditional models by adjusting its learning to historical fluctuations. By translating these complex computational breakthroughs into an interactive platform, this technology moves beyond theoretical modeling to provide a functional shield for the world's most vulnerable producers, effectively bridging the gap between ancestral techniques and modern atmospheric science.

Awards Won:
London International Youth Science Forum CIC: Full scholarship to attend the London International Youth Science Forum, and a $1,500 cash stipend for travel expenses.
Association for the Advancement of Artificial Intelligence: AAAI Student Memberships for each finalist that is part of the 1st, 2nd, and 3rd Prize Winning projects and 5 Honorable Mention winning projects (up to 3 students per project) (in-kind award / part of the 1st-3rd prize)