**Draft Book Proposal for MIT Press: *The Effect Propagation Process***

This document outlines the core arguments for the publication of the research monograph, *The Effect Propagation Process (EPP): A Dynamic Theory of Causality* by Marvin Hansen.

**1. What is the book about, and what is its central argument?**

This book introduces the Effect Propagation Process (EPP), a new, formally complete, and computationally implemented framework for causal inference.

The central argument is that the dominant paradigms of computational causality—while foundational—are built on an outdated philosophical assumption of a fixed, background spacetime. This makes them fundamentally ill-equipped to handle a critical and growing class of problems in dynamic systems engineering, characterized by:

* Non-Euclidean data representations (e.g., graphs, geometries).
* Non-linear temporal structures (e.g., multiple time scales, feedback loops).
* Emergent causality (i.e., causal structures that change dynamically).

EPP addresses this by making a foundational shift: it redefines causality as a continuous process of effect propagation that is "spacetime-agnostic." It achieves this by adopting and formalizing the "Causaloid," a concept from quantum gravity research that unifies 'cause' and 'effect' into a single, computable entity.

The book presents this not merely as a theory, but as a comprehensive, three-part intellectual contribution:

1. **A New Philosophy:** It details the dedicated metaphysics, ontology, and epistemology required to reason about causality without a fixed spacetime.
2. **A Rigorous Formalization:** It translates these philosophical principles into a precise, set-theoretic formalization, ensuring logical consistency.
3. **A Proven Implementation:** It demonstrates the theory's viability through its complete, open-source implementation in DeepCausality, a high-performance Rust library hosted by the Linux Foundation.

**2. How is this book different from others on the same topic (Competition)?**

This monograph does not seek to replace classical causality but to address its limitations in specific, complex domains. Its primary distinction is its fundamental departure from the assumptions that underpin existing methods.

* **Against Pearl's SCMs/DAGs:** Pearl's framework is the gold standard for static causal reasoning but assumes an acyclic, static causal structure within a fixed background spacetime. EPP is explicitly designed for systems where the structure itself is dynamic and can contain feedback loops, and where the "spacetime" (i.e., the context) is an active, non-Euclidean entity.
* **Against Granger Causality & Dynamic Bayesian Networks (DBNs):** These methods model time-series data but assume a stable causal structure and linear, uniform time. EPP is architected to handle non-linear, multi-scale temporal representations and, most critically, situations where the causal relationships themselves emerge and change over time (e.g., dynamic regime shifts in financial markets).
* **Against the Rubin Causal Model (RCM):** RCM is a powerful statistical framework but is not designed for non-Euclidean data representations or emergent causality.

In short, while existing methods provide tools to reason *within* a given causal model, EPP provides the language and architecture to reason about how the causal model *itself* evolves. The inclusion of a custom, high-performance hypergraph implementation (UltraGraph) capable of handling over 100 million nodes on a standard laptop proves this is a practical, not just theoretical, advantage.

**3. Who is the intended audience for this book?**

The book is aimed at a specialist audience but bridges several key disciplines, creating a broad market potential.

* **Primary Audience:** Researchers and advanced graduate students in **Artificial Intelligence and Machine Learning**, particularly those focused on causality, graphical models, and foundational principles of AI. The book provides both a novel theoretical framework and a robust open-source tool for their research.
* **Secondary Audience (Practitioners):** Engineers and quantitative analysts in domains where dynamic, complex systems are prevalent. The manuscript and supporting documents identify **quantitative finance, avionics, advanced analytics, and complex control systems** as key application areas. The implementation in Rust makes it highly relevant to performance-critical industries.
* **Tertiary Audience (Interdisciplinary):**
  + **Philosophers of Information and Science:** The book's direct engagement with the work of Luciano Floridi and its construction of a new "applied philosophy" for AI will be of significant interest.
  + **Theoretical Physicists:** The framework's roots in the conceptual challenges of quantum gravity and its use of the Causaloid concept will appeal to researchers working on the foundations of causality and spacetime.

**4. Why is the author qualified to write this book?**

Marvin F. L. Hansen possesses a rare combination of deep theoretical knowledge, high-performance engineering skill, and practical industry experience.

* **Academic & Theoretical Depth:** With Master's degrees from Harvard University and the University of Auckland, a degree in Biomedical Informatics, and a prior monograph on formal verification ("Concurrency in Scala"), Hansen has a proven track record in rigorous, interdisciplinary research.
* **Technical Innovation & Authority:** He is the inventor of DeepCausality, the first hyper-geometric causal inference library in Rust, and the principal author of the EPP framework. His work has been vetted and praised by top-tier institutions, including an MIT Deep Tech Bootcamp and the Harvard Innovation Lab.
* **Real-World Application:** As the founder of Emet-Labs, a FinTech research company, and the former Head of Quantitative Research for an investment technology firm, he has direct experience applying advanced computational theories to solve complex, high-stakes problems in quantitative risk management.

Hansen is uniquely positioned to write this book because he did not just conceive of the theory; he built the tools, solved the engineering challenges, and understands the real-world problems it is designed to address.

**5. How will the author and his platform help promote the book?**

The book is supported by an exceptional and pre-existing promotional platform that extends far beyond the author himself.

* **The Linux Foundation:** The DeepCausality project is hosted and governed by the prestigious **LF AI & Data Foundation**. It underwent a rigorous due diligence process and was unanimously accepted by a Technical Advisory Committee that includes members from **IBM, Nokia, SAS, Baidu, and Ericsson**. This provides unparalleled industry credibility and a direct channel for announcements, blogs, and conference presentations to a global audience of AI/ML developers and researchers.
* **A Thriving Open-Source Project:** The book is not about a static idea; it's the foundational text for a living, growing open-source project. The GitHub repository serves as a continuous marketing engine, drawing in users who will become readers. The author, as project lead, is the central figure in this community.
* **Industry and Academic Speaking:** The author is positioned to speak at premier conferences across AI and Machine Learning (e.g., NeurIPS, ICML), specialized programming languages (e.g., RustConf), and quantitative finance.
* **Established Web Presence:** The project website (deepcausality.com) and LF AI & Data resources provide a central hub for information, tutorials, and links to purchase the book.

This combination of a powerful institutional partnership with the Linux Foundation and a vibrant open-source community provides a unique and robust platform to ensure the book reaches its target audience.