

ERC Advanced Grant

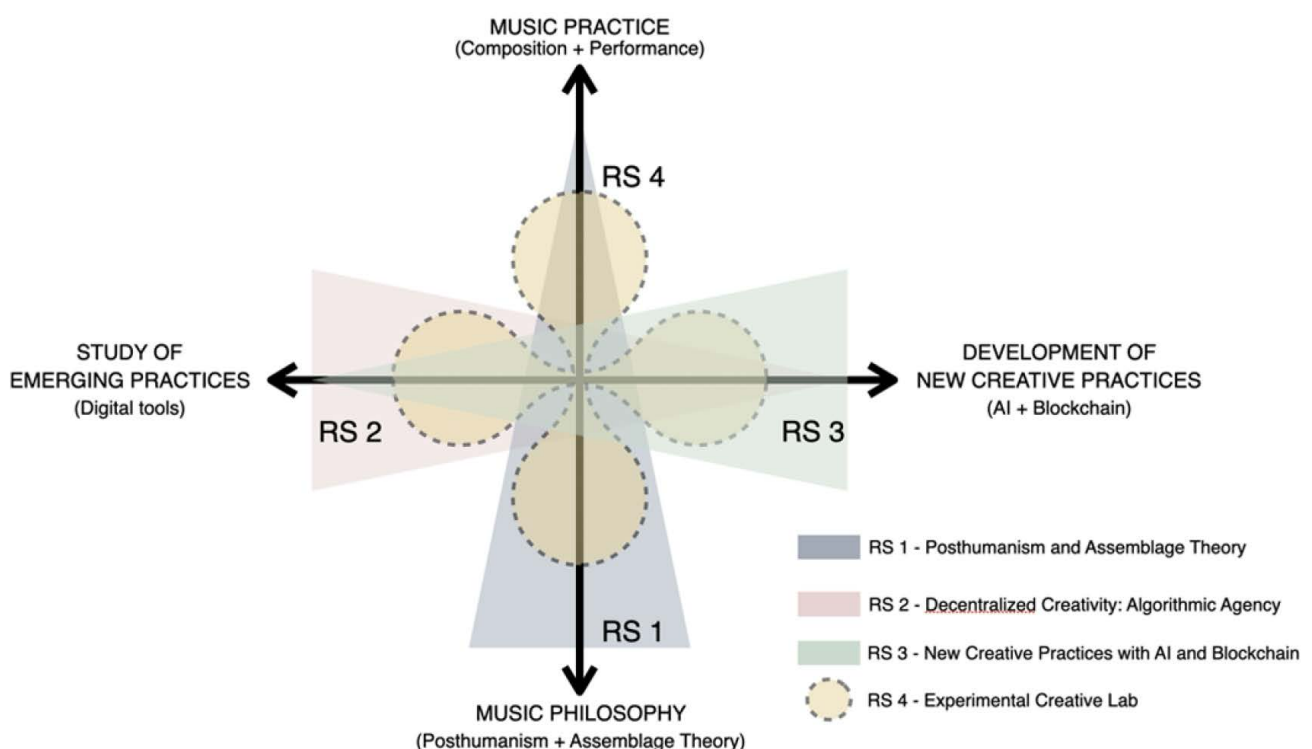
Posthuman music

Creative Practices after AI and Blockchain

Artificial Intelligence (AI) and blockchain technologies are becoming increasingly intertwined with human creativity, leading to novel forms of ‘posthuman’ musical expression that decentralize traditional notions of creative agency, authorship, ownership, and the ontology of the artwork. This poses unprecedented challenges and opportunities for new creative practices that need to be investigated, both scholarly and artistically.

This project explores the transformative impact of AI and blockchain on contemporary musical practices, investigating the evolving concept of Posthuman Music as a forward-looking perspective that brings together human and non-human creative agents. Through analysis of existing practices and experimental prototyping, the project aims to forge new conceptual frameworks and craft new creative tools to enhance emerging more-than-human creative practices.

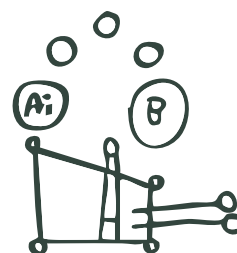
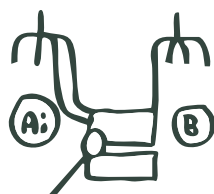
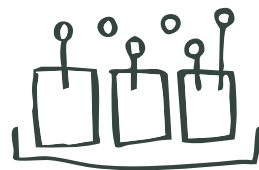
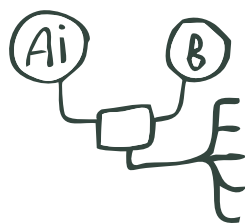
Posthuman Music operates at the intersection of composition, music philosophy, artificial intelligence, blockchain technology, and broader musical creativity, incorporating perspectives from Posthumanism and Assemblage Theory. Central research topics include critical reconsiderations of notions of creativity, agency, authorship, and the very nature of musical works.



Led by Paulo de Assis, an experienced ERC Principal Investigator, and an international team from composition, music philosophy, performance, digital media studies, and computer science, the project will develop innovative creative practices, transforming music concepts for the digital era. Attentive to the most recent developments, the project will adapt to evolving conditions, ensuring cutting-edge research.

Combining theoretical investigations with practice-based research, the project adopts a transdisciplinary methodology across four interconnected Research Strands (RS):

- **RS1** Investigating the ontological and conceptual consequences of AI and blockchain for music
- **RS2** Developing digital media frameworks for situating posthuman musical practices
- **RS3** Creating innovative compositional tools and techniques using AI and blockchain
- **RS4** Experimenting with smart contracts in music through an exploratory Creative Lab, generating new works and prototypes.



Objectives

The project has the following central objectives:

1. Study the ontological shifts in music due to AI and blockchain. Assess how their integration affects the nature of what constitutes a musical work. Investigate the philosophical and practical shifts in defining and understanding music in the digital age.
2. Develop a theoretical framework that integrates insights from composition, music philosophy, media studies, digital art, and blockchain technology.
3. Investigate the impact of AI and blockchain technologies on changing the roles of composers, performers, listeners, and producers.
4. Conduct practice-based experiments to develop novel creative practices and new taxonomies for musical works, reflecting the collaboration between human composers and agential digital technologies.
5. Analyze the impact of AI and blockchain on musical expression through a series of controlled experiments and case studies.

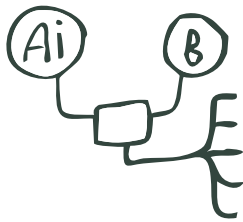
Overall Research Questions

- What can human creativity learn from AI generative processes? (all RS)
- How can composition-based research contribute to the development of AI and blockchain tools, adding artistic considerations and aesthetic values to the technological aspect of coding and programming? (RS4)
- How do AI and blockchain technologies enhance or jeopardize the human element in music composition and performance? (RS2, RS3)
- How does the introduction of blockchain and smart contracts redefine the authorship, distribution, conceptual identity, and nonhuman agency of musical works? (RS2)
- How does the emergence of AI and blockchain technologies reshape music ontology, similar to how historical technologies (notation, mirrors, print) highly impacted the definition of music? (RS1)

The Four Research Strands

Research Strand 1. Posthumanism and Assemblage Theory

This research strand explores the intersection of posthumanism and assemblage theory in relation to emerging digital musical practices, particularly AI and blockchain based.



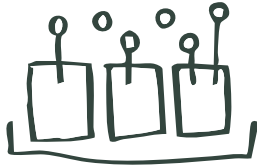
As music undergoes a significant transition into the algorithmic and posthuman-agential realm, there is a critical need for new philosophical frameworks to understand, situate and guide these changes. This line of research will investigate how posthuman perspectives and assemblage theory can offer insights into the evolving relationships between human and nonhuman agents in musical creation, challenging traditional notions of authorship, agency, and the work-concept. By examining the implications of AI, blockchain, and other digital technologies on musical practices, this strand aims to develop new theoretical models that can address the complex assemblages of human and nonhuman elements in contemporary music-making.

RS1 - Research Questions

- How can posthumanist perspectives inform our understanding of agency and creativity in AI-enhanced musical practices?
- In what ways does assemblage theory offer new models for conceptualizing musical works in the digital age?
- How do emerging technologies like AI and blockchain challenge and reshape traditional notions of the artwork and its constitutive parts?
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Research Strand 2. Decentralized Creativity: algorithmic Agency

This research strand will examine how artificial intelligence and blockchain technologies are reshaping artistic practices, cultural production, and notions of creativity from the perspective of digital media studies. Building on recent scholarship exploring the critical and disruptive potential of AI art (Catlow et al 2017; O'Dair 2021; O'Dwyer 2017; Whitaker 2019; Zeilinger 2022b), this strand will investigate how these technologies enable new forms of distributed authorship and challenge traditional intellectual property regimes. Of particular interest is how AI and blockchain afford tactical interventions (Zeilinger 2022b) that can destabilize conventional ideas of human creative agency and ownership of cultural works. This strand will develop new theoretical frameworks and methodologies for analyzing AI/blockchain art projects as 'posthumanist agential assemblages' (Zeilinger 2022b) that redistribute creative agency across human and nonhuman actors. By studying emerging practices at the intersection of AI, blockchain, and the arts, this research aims to shed light on broader societal implications of these technologies and contribute to debates around the future governance of artificial intelligence and digital assets in cultural domains.

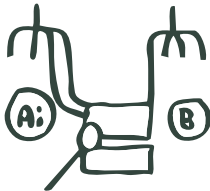


RS2 – Research Questions

- How do AI and blockchain technologies enable new forms of distributed authorship and creative agency in artistic practices?
- In what ways do AI/blockchain art projects challenge existing intellectual property regimes and notions of cultural ownership?
- What new theoretical frameworks and methodologies are needed to analyze AI and blockchain-based artworks as posthuman agential assemblages?
- How might the context-specific (tactical) use of AI and blockchain in art point towards alternative models for governing these technologies in wider cultural and economic spheres?

Research Strand 3: New Creative Practices with AI and Blockchain

Research Strand 3 addresses creative challenges and opportunities posed by AI and blockchain for music. As traditional notions of composition and performance become



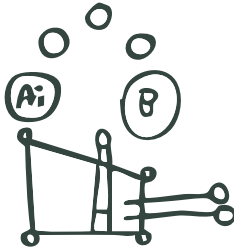
increasingly inadequate in the face of these emerging technologies, this RS explores novel forms of collaboration between human composers and AI agents, aiming to enhance creative processes and redefine artistic agency. In close collaboration with RS4, this strand will conduct practice-based research on four main topics: (1) Generative AI, exploring human-AI collaborative composition; (2) Generative NFTs, examining dynamic digital assets; (3) Algorithmic Workflows, integrating AI and blockchain into traditional practices; (4) Particalisation of Music, investigating the deconstruction and reassembly of musical works.

RS3 – Research Questions

- How could musical works be deconstructed and reassembled to accommodate the fluid and dynamic potential of new technologies?
- What frameworks and workflows could be developed to integrate AI-generated and blockchain content into traditional music practices?
- How can the creation of dynamic digital assets on the blockchain influence creative music practices?

Research Strand 4 — Creative Lab

This experimental research strand will focus on generative art, including AI tools and blockchain's smart contracts as part of the generative process. Beyond investigations on the role of AI in tasks such as classification, recommendation, or plagiarism detection, we will focus on the creative potentials of AI as a proactive and generative agent in music composition.



The researchers involved in this RS will be composers and sound artists with excellent knowledge of coding and AI tools. The inclusion of Generative AI made by composers as central part of the research enables a critical and creative examination of the notions of creativity and authorship in the digital age, challenging existing paradigms and considering whether AI can exhibit true creativity, or if it simply reconfigures human creative outputs through sophisticated algorithmic processes.

This exploration is essential for articulating the future roles of composers and musicians in an increasingly technologically fully-integrated landscape.

While the project will remain stylistically agnostic and open to diverse musical languages, the core research team is particularly trained in Western notated art music, which will be critically examined as a starting point for the investigations.

RS4 Starting Research Questions

- How can AI and blockchain technologies be integrated to create new forms of generative music that exhibit posthuman agency?
- In what ways do smart contracts on the blockchain enable the creation of evolving, “living” musical works that challenge traditional notions of authorship and ownership?
- What new creative methodologies emerge when composers become designers of AI and blockchain-based generative systems?
- How might the concept of “blockchain vitalism” be applied to create musical works that autonomously evolve and interact with human audiences?
- What are the ethical and aesthetic implications of distributing creative agency between human composers, AI systems, and blockchain networks in music creation?

RS4 addresses four main topics in four intertwined work packages:

Generative AI, exploring human-AI collaborative composition.

The integration of AI in music creation allows for unprecedented forms of collaboration between human composers and AI agents, requiring a thorough investigation into how these interactions can enhance creative processes. This work package focuses on developing and studying Generative AI systems that can work alongside human composers, pushing the boundaries of creative expression.

Generative NFTs, examining dynamic digital assets.

The rise of dynamic NFTs poses questions about authenticity and artistic value, necessitating research into how these digital assets can empower artists with greater control and new revenue models. Our Generative NFTs work package explores the creation and evolution of these dynamic digital assets, examining their potential to transform how music is created, owned, and distributed.

Algorithmic Workflows, integrating AI and blockchain into traditional practices.

The Algorithmic Workflows work package focuses on developing frameworks that automate and enhance artistic productivity, seamlessly blending AI and blockchain technologies with established musical practices.

Particalisation of Music, investigating the deconstruction and reassembly of musical works.

The concept of particalisation of music involves deconstructing musical works into their fundamental elements for dynamic reassembly. This approach is crucial because traditional views of music often fail to capture its inherent fluidity and adaptability in the digital age. The Particalisation of Music work package investigates how understanding music as a collection of interacting particles allows for a more nuanced appreciation of its complexity and the ways it can be reconfigured and transformed.