Report on the outcomes of a Short-Term Scientific Mission[1]

Action number: CA22145

Grantee name: Tiago Hirth

Details of the STSM

Title: Towards Creating an exhaustive Puzzle Data Base for AI and Game Heritage

Description of the work carried out during the STSM

Description of the activities carried out during the STSM. Any deviations from the initial working plan shall also be described in this section.

(max. 500 words)

The STSM was carried out from February to early March 2026, focusing on the intersection of mechanical puzzles, game AI, and digital heritage. The mission was divided into three primary phases:

Phase 1: Slocum Puzzle Collection (Bloomington, IN): I spent the first two weeks at the archives in Bloomington conducting on-site research of the Slocum Puzzle Collection. My work involved scrutinizing the MSS (manuscript) files and analyzing selected physical puzzles to establish a structural framework for a comprehensive puzzle database. This built upon preliminary online catalog research conducted in late 2025.

Phase 2: Gathering 4 Gardner 16 (San Francisco, CA): Following the archival work, I attended the G4G16 conference. This served as a critical networking hub where I interacted with key figures in the puzzle and recreational mathematics community, including Nick Baxter and Dick Hess. These exchanges focused on rule-set definitions and the scientific relevance of puzzle mechanics.

Phase 3: Stanford University Archives (Stanford, CA): The final two weeks involved a slight deviation from the initial plan (which suggested a potential return to Bloomington or private collections). Instead, I utilized the archives at Stanford University to examine the Martin Gardner papers. This archival research was essential for mapping historical data points and connecting mechanical puzzles to the broader board game heritage

[1] This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the Grant Holder Manager to verify the grant documents compliance and proceed with the payment.

Description of the STSM main achievements and planned follow-up activities

Description and assessment of whether the STSM achieved its planned goals and expected outcomes, including specific contribution to Action objective and deliverables, or publications resulting from the STSM. Agreed plans for future follow-up collaborations shall also be described in this section.

(max. 500 words)

The mission successfully achieved its primary goals of data collection, networking, and scientific contribution to the Action's objectives. Key achievements include:

Database Development: I successfully structured the foundation for a Mechanical Puzzle database by analyzing the Slocum classification system. This includes the identification of new "ludemes" that will facilitate the future implementation of these puzzles into the Ludii library.

Scientific Contribution: The archival research at both Bloomington and Stanford provided the necessary material to begin drafting a chapter for the Handbook on Mathematical Games, a key output for WG4.

Network Expansion: Engaging with scholars like Nick Baxter and Dick Hess established a collaborative network that bridges the gap between private collectors and the academic AI community. These connections are expected to yield a future paper regarding mechanical puzzles and AI.

Heritage Mapping: By connecting the Slocum collection and Gardner papers, I have begun mapping the geolocation and historical manufacture of these puzzles, contributing to the Action's goal of preserving game heritage.

Planned Follow-up:Finalize the initial dataset for integration into the Ludii platform. Complete the draft of the WG4 Handbook chapter. Continue collaborations with the G4G community to refine the database's rule-sets.