# Reproduction of Hanabi AI

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Reproduction and extension of an exploratory analysis of different implementations of a game-playing AI for the board game Hanabi. The original paper examined three implementations: a baseline called 'Outer' which has been used in past implementations, an intentional AI (called Intentional), and an AI which combines the two (called 'Full'). The authors of the original paper found that the Intentional AI outperformed the other two implementations when paired with a human player. Here we reproduce their results and extend our analysis to consider whether player perception of AI skill, intentionality, or likeability may have influenced the score, regardless of implementation. We also perform Machine Learning on the game logs and propose an update to the AI framework to include predictive modeling of player behavior.

CCS Concepts: • **Computer systems organization** → **Embedded systems**; *Redundancy*; Robotics; • **Networks** → Network reliability.

Additional Key Words and Phrases: datasets, neural networks, gaze detection, text tagging

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## 1 Introduction

Template: ACM's consolidated article template, introduced in 2017, provides a consistent LaTeX style for use across ACM publications, and incorporates accessibility and metadata-extraction functionality necessary for future Digital Library endeavors. Numerous ACM and SIG-specific LaTeX templates have been examined, and their unique features incorporated into this single new template.

Our introduction...

## 2 Exploratory Data Analysis

Discuss our EDA methods...

ANOVA / Tukey

## 3 Methods

Study description

Quantitative Analysis

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## 4 Results

What do we find…our reproduction supports the original author's conclusion about the Intentional AI

## 5 Discussion and Conclusion

We conclude that…

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## 6 CCS Concepts and User-Defined Keywords

The ACM Computing Classification System — https://www.acm.org/publications/class-2012 — is a set of classifiers and concepts that describe the computing discipline. Authors can select entries from this classification system, via https://dl.acm.org/ccs/ccs.cfm, and generate the commands to be included in the LaTeX source.

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| Non-English or Math | Frequency | Comments |
|---|---|---|
| Ø | 1 in 1,000 | For Swedish names |
| $\pi$ | 1 in 5 | Common in math |
| \$ | 4 in 5 | Used in business |
| $\Psi_1^2$ | 1 in 40,000 | Unexplained usage |

## 8 Acknowledgments

Identification of funding sources and other support, and thanks to individuals and groups that assisted in the research and the preparation of the work should be included in an acknowledgment section, which is placed just before the reference section in your document.

This section has a special environment:

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...
\end{acks}
```

so that the information contained therein can be more easily collected during the article metadata extraction phase, and to ensure consistency in the spelling of the section heading.

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