

Game AI for Cultural Heritage: Outcomes from the GameTable Third Grant Period Opening Meeting

ICGA Journal

1–8

© The Author(s) 2026



Article reuse guidelines:

sagepub.com/journals-permissions

DOI: 10.1177/13896911261446593

journals.sagepub.com/home/icg



Aloïs Rautureau¹, Éric Piette¹, Tim Penn², Summer Courts², James Goodman³,
Walter Crist⁴ and Dennis JNJ Soemers⁵ 

Abstract

On the 19th and 20th of February 2026, the GameTable COST Action held a meeting in Prague to kick off its third grant period. This meeting focused on discussions around joint projects between researchers in the humanities and game-playing artificial intelligence (AI) agents, as well as projects specific to one of the disciplines. A key point of discussion was the main goal of the COST Action: advancing research in human-like game AI. Additionally, as the GameTable COST Action approaches its conclusion in 2027, participants discussed future prospects for collaboration between humanities and computer science scholars to further our understanding of games, both past and present.

Keywords

GameTable, working group meeting, tabletop games, artificial intelligence, cultural heritage

Received: April 7, 2026; accepted: April 8, 2026

1 Introduction

On the 19th and 20th of February 2026, members of all working groups of the GameTable COST Action CA22145 (Piette et al., 2024) met in Prague for the opening meeting of the third grant period. GameTable is an interdisciplinary network of scholars studying tabletop games from both computational and cultural perspectives, encompassing fields such as artificial intelligence (AI), archaeology, mathematics, and education.

The meeting provided an opportunity to reflect on work conducted during the previous grant period, as well as to plan the remaining activities of the COST Action and explore possibilities for collaboration beyond its formal duration, until November 2027. A total of 22 participants attended in person to discuss ongoing projects and future directions; this paper summarizes the main outcomes of these discussions.

Section 2 presents the key points of the ongoing work reported by members, organized into cultural heritage and AI projects (Section 2.1), imperfect-information games (Section 2.2), and human-like AI (Section 2.3). Section 3 summarizes the discussions concerning future projects and research directions. Finally, Section 4 concludes the report.

¹ICTEAM, UCLouvain, Louvain-la-Neuve, Belgium

²Department of Classics, University of Reading, Reading, UK

³Queen Mary University of London, London, UK

⁴Centre for the Arts in Society, Leiden University, Leiden, the Netherlands

⁵Department of Advanced Computing Sciences, Maastricht University, Maastricht, the Netherlands

Corresponding Author:

Dennis JNJ Soemers, Department of Advanced Computing Sciences, Maastricht University, Maastricht 6200 MD, the Netherlands.

Email: dennis.soemers@maastrichtuniversity.nl

2 Contributed Talks

Several members presented talks on ongoing work related to the activities of the COST Action. This section summarizes these contributions and highlights the main themes that emerged from them.

2.1 Cultural Heritage and AI Projects

One of the key aims of the GameTable network is to encourage interdisciplinary collaboration between cultural heritage researchers and AI specialists (Soemers et al., 2025). Such collaborations have the potential to make significant contributions both to our understanding of heritage games and to the field of game AI. However, this remains a challenging research area to enter, as relatively little prior work exists, resulting in a lack of established methodologies and worked examples on which new research initiatives can be based (for exceptions, see Courts et al., 2026; Crist et al., 2026, 2024a; Crist & Soemers, 2023; Piette et al., 2025).

At previous meetings (Soemers et al., 2025, 2024), we highlighted the need to identify meaningful metrics for historical games that can be analyzed using AI methods. We have also considered the difficulty of designing projects that are of equal interest to experts in both domains. Despite these challenges, a key outcome of the GameTable network to date has been the recognition of the importance of capacity-building initiatives that support collaboration and enable researchers from both communities to work together more effectively.

A key obstacle to effective collaboration is the difficulty of talking across disciplines: specialist vocabulary, methods, data types, and research questions are framed very differently in the humanities and in computer science. However, there is an emerging consensus that the best way to find a mutually beneficial way forward is through concrete action centered on case studies. As a result, over the past 12 months, GameTable members from Working Group 1 (Search, Planning, Learning, and Explainability) and Working Group 2 (Cultural Heritage of Games) have been piloting cross-working group collaborations as part of a capacity-building exercise, which will culminate in a *Journal on Computing and Cultural Heritage* Special Issue on Computational Techniques for Games Heritage. Some of the projects resulting from cross-working group collaborations were presented at the Prague meeting.

Walter Crist presented their latest project (Crist & Piette, 2025) in collaboration with Éric Piette, which examined the gameplay effects of the change of board geometry when the Royal Game of Ur changed to the game of 20 squares at the turn of the second millennium BCE (Finkel, 1991, 2007). Rulesets consistent with the archaeological evidence for these games as well as the ethnographic record of similar traditional board games were implemented in the Ludii general game playing system (Piette et al., 2020) and the play was simulated using Upper Confidence Bounds applied to Trres based Monte-Carlo Tree Search (Kocsis & Szepesvári, 2006) agents while calculating several different gameplay metrics (Piette et al., 2021). The results showed that changing the board from that of the Royal Game of Ur to the game of 20 squares resulted in a game that lasted more turns and had more lead changes during the course of the game, which can reasonably explain the longevity and increased popularity of the game of 20 squares.

Tim Penn, James Goodman, and Summer Courts presented their ongoing work using the Tabletop Games framework (TAG) (Gaina et al., 2020) to research the effects of biased Roman dice on the games of Pente Grammai and Ludus Duodecim Scriptorum. Roman dice, most frequently made from bone, are known to be biased, with work by Ellen Swift finding that across 49 real Roman dice, a striking 45% of all results were either a 1 or a 6 (Swift, 2017). These biases were shown to impact both games, albeit differently. Pente Grammai (or “five lines”) is a Greco-Roman game wherein players move their five pieces around a track comprised of two rows of five spaces, forming five “lines” according to the roll of a single die, with the ultimate goal being to maneuver all of one’s five pieces onto the middlemost line—the sacred line—before one’s opponent can do so (Kidd, 2017; Schädler, 2009). This game was only minimally affected by the biased dice. In the simulated games, games played with Roman dice ran slightly longer than those played with modern, balanced dice and had fewer dramatic moves, or moves in a game that shift win probability by more than 10% in either direction. Ludus Duodecim Scriptorum is a Roman game similar to modern backgammon where players race their pieces around a track according to the roll of two dice, with the ultimate goal being to bear all of one’s pieces off the board (Schädler, 1999). Ludus Duodecim Scriptorum games simulated using the probability distribution of biased Roman dice were notably shorter than their counterparts simulated using a modern, precision-manufactured die, but other facets of the game remained largely unchanged. Full results will be presented in the *Journal on Computing and Cultural Heritage*’s special issue.

One of the central challenges of studying historical games, particularly those from the distant human past, is that we only have an imperfect understanding of rules and mechanics, because these were seldom preserved in detail in our available sources (Crist et al., in press; Crist & Soemers, 2023). This uncertainty sometimes presents a barrier to collaboration, especially for computer scientists who are understandably more accustomed to working with more complete information,

such as the structured, defined rulesets associated with games which are still played today, like chess. As part of the process of breaking down boundaries, an afternoon session was dedicated to playing heritage games about which we have incomplete information, led by Walter Crist (Leiden University) and Jacob Schmidt-Madsen (Max-Planck Institute for the History of Science). The objective of this workshop was to leverage games as a social lubricant (on ancient games as social lubricants see (Courts, 2022; Crist et al., 2016) to encourage meeting participants from a range of backgrounds to think about the inherent challenges of studying historical games, especially those approached from an archaeological perspective, about which we have limited information. It also provided the opportunity to directly engage with the materials of the games in question, explore their material affordances, and become familiar with the challenges to reconstructing such games, which can be explored in a more meaningful way by playing rather than through presentations or abstract discussion. We hope this conversation will lead to further cross-working group collaborations.

2.2 Imperfect-Information Games

Imperfect information is a defining feature of many games of interest to the GameTable COST Action, particularly those embedded in social and cultural contexts, such as traditional card and board games. In these games, players must make decisions under uncertainty, reasoning about hidden information such as opponents' hands or the identity of pieces. Despite their prevalence, modeling imperfect-information games in a general and scalable way remains a significant challenge, especially in the context of general game playing (Piette, 2016), although a few previous attempts have been made (Koriche et al., 2017a, 2017b).

A central difficulty lies in the limitations of existing formal models. Traditional approaches, such as Extensive Form Games (von Neumann & Morgenstern, 1944) and Factored-Observation Stochastic Games (Kovařík et al., 2022), require agents to construct and maintain estimates of the game state based on partial observations. In practice, this often leads to game-specific implementations of state estimation, limiting the generality of agents and hindering their applicability across a wide range of games. This is particularly problematic for GameTable, where the goal is to support research across diverse historical and cultural games with minimal domain-specific assumptions.

In previous work, the Belief Stochastic Game (Belief-SG) model (Morenville & Piette, 2024) has been introduced as a first step toward addressing this challenge. The key idea of this framework is to externalize the state estimation process: instead of requiring agents to infer hidden information, the game model itself maintains a belief state representing uncertainty about the underlying game state. This belief state encodes both public and private knowledge and allows agents to focus solely on decision-making and strategy. By shifting the burden of inference from the agent to the model, Belief-SG enables the design of more general agents that can be applied across a broad class of imperfect-information games, including those arising in cultural heritage contexts.

Building on this model, Achille Morenville explored alternative representations of belief states at the Prague meeting. In particular, he investigated a constraint-based approach in which uncertainty is represented as a set of logically feasible game states encoded as a constraint satisfaction problem (Morenville & Piette, 2025). In this formulation, hidden information is captured through the domains of possible values constrained by game rules and observed actions, allowing efficient pruning of impossible states. This approach can be extended with probabilistic inference using belief propagation to estimate likelihoods over remaining possibilities. Experimental results indicate that constraint-based representations alone can achieve performance comparable to more complex probabilistic models, suggesting that relatively simple logical reasoning may suffice for effective decision-making in many imperfect-information settings.

In addition to these published works, ongoing research presented at the meeting explored a simplified belief representation based on constraint-based impossibility reasoning. Rather than maintaining full probability distributions over game states, this approach focuses on identifying and eliminating states that are inconsistent with publicly available information, thereby reducing the space of possible states that must be considered. This perspective is particularly well-suited to tabletop games, where discrete structures and well-defined rules allow efficient logical reasoning over large state spaces.

Complementing these modeling advances, Morenville also presented recent work on *Valet*, a standardized testbed of traditional imperfect-information card games developed within the GameTable network (Goadrich et al., 2026). *Valet* comprises a diverse set of 21 card games spanning multiple genres, cultural origins, and information structures, providing a common benchmark suite for evaluating game-playing algorithms. By standardizing rule implementations and enabling systematic comparison across games, *Valet* addresses a key limitation of existing research, where algorithms are often evaluated on a small and inconsistent set of domains. The testbed thus supports more robust and reproducible evaluation of AI methods for imperfect-information games.

Together, these contributions highlight a coherent research direction within GameTable: the development of general, domain-independent methods for modeling and reasoning in imperfect-information games.

2.3 Human-Like AI in Games

A recurring theme within the GameTable COST Action is the development of “human-like AI” models that move beyond the traditional focus on superhuman performance. While modern AI systems achieve strong results through large-scale search and computation, they typically fail to capture the intuitive, selective, and cognitively constrained nature of human decision-making (Rautureau & Piette, 2025). Developing such models is both a key objective of GameTable and an important research direction for AI more broadly. Several related presentations in Prague discussed these themes.

Aloïs Rautureau presented their work on modeling working memory constraints of human players within Monte-Carlo Tree Search algorithms (Rautureau et al., 2026). The presented model is based on two ideas from cognitive science: Atkinson’s model of working memory (Atkinson & Shiffrin, 1968), modeled by recycling tree nodes that were least recently accessed by the search algorithm (Powley et al., 2017), and directed subgoal solving, modeled using a two-level search scheme (Allis, 1994). The model was competitive with existing algorithms while using only a fraction of the memory, showcasing the possibility of designing capable search algorithms while using cognitively plausible amounts of memory. One limitation highlighted during subsequent discussions is the difficulty of establishing a clear quantitative correspondence between human memory and that of a computer.

Tim Penn, Summer Courts, and James Goodman also presented their ongoing work on human-like play within the framework of the Ludus ex Machina (LEM) project, which they are undertaking in collaboration with Éric Piette, Walter Crist, and Aloïs Rautureau. It is widely acknowledged that human-like play often involves nonoptimal play strategies: for example, the Roman poet Ovid advises men to charm female love interests by letting them win (Ovid, *Ars Amatoria*, II.203-208), but little modeling has been done in this area. Starting from the acknowledgment that human-like play is culturally conditioned, the LEM team has focused on Roman attitudes to playing board games, and particularly games of chance. By running comprehensive keyword searches for gaming-related terms in the Digital Loeb Classical Library,¹ the largest repository of translated ancient Greek and Latin sources relating to the Roman period, it has been possible to identify a substantial number of passages—in excess of 500—which refer to game play and play strategies or behaviors. The LEM team presented a work-in-progress behavioral taxonomy based on these passages (e.g., playing to lose, cheating, deliberately prolonging a game, etc.), as well as preliminary suggestions about how different nonoptimal play styles might be modeled by AI agents for the Roman game Ludus Duodecim Scriptorum, mentioned above (Schädler, 1999). The LEM team’s future work will center on further explorations on defining human-like play as well as on exploratory modeling of some of the play styles and traits identified while building the behavioral taxonomy within the TAG (Gaina et al., 2020).

3 Discussions

Aside from contributed talks, the Prague meeting was also a place to discuss future directions and projects for the GameTable COST Action. A summary of these discussions is presented in this section.

3.1 Sharing Material for Game AI Education

The members present discussed the possibility of setting up a shared repository of educational material with a wide scope encompassing games and computer science. This would include AI for games and procedural design among other subjects.

Among the types of content discussed were lecture slides, as well as assignments or best practices. For the latter, one concern was the use of large language models from students to complete said assignments. Some members observed that a growing percentage of students are negatively affected by their use, likely due to a mismatch between increased ambition and the quality of the resulting work. The main idea proposed to mitigate this effect was to check that the students understood the reasoning process that went into completing a project, for example through an oral presentation.

Contributed assignments could include common mistakes made by students, as well as what knowledge the assignment is assessing. One issue is the categorization of material for ease of access. It is common for educators to create their course’s slides in a single file, with contents that can cover a wide range of subjects. Among the proposed solutions were tagging slides with keywords, either automatically via postprocessing or manually, or asking contributors to split their slides. However, it was noted that requiring manual work from contributors could add friction, possibly impacting adoption in a negative way.

The COST Action’s members plan to set up an initial version of this shared repository before the IEEE Conference on Games 2026 in order to be able to advertise and gather feedback on this initial prototype.

3.2 Further Work on Human-Like AI

As stated in Section 2.3, the development of human-like AI is of particular interest to the GameTable COST Action members. Discussions at the Prague meeting following the contributed talks revolved around several key points. Human-like AI must reflect genuine human cognitive constraints, such as limited working memory, imperfect information handling, and an inability to intuitively process complex probability distributions might arise in games involving several dice. These human cognitive constraints, however, are difficult to address using typical constraint-based approaches as formally defining these constraints is itself a complex endeavor. Moreover, there is a question of granularity: is a complete model of decision-related biomechanical phenomena observed in the human brain necessary for an artificial system to be human-like, or would a model of high-level features observed in psychology be sufficient? Have these cognitive constraints varied over time as humanity evolved, or can it be assumed that human cognition related to game playing is relatively stable over time?

Unlike systems optimized to win, human-like AI should capture the social and motivational dimensions of play that may not always be compatible with winning, including dramatic decision-making, avoiding frustrating one's opponent, playing to learn, and the all-too-human propensity for shifting motivations throughout a game. These issues could be addressed through reward design, but require extensive collaboration between researchers focusing on cultural heritage and AI. On the notion of suboptimal playstyles for example, it was noted that there is a need to be careful while defining "competitive obsession"—a desire to win at all costs—as a play style, as competitiveness can be a value judgment applied by one or more players to another player to describe social etiquette rather than anything inherent to the way in which a game participant plays.

A substantial amount of discussion time was devoted to cheating in games: while cheating is in many ways emblematic of play in the contemporary imagination (Kreider, 2025), our understanding of the implications of cheating for heritage game studies and AI in games lags far behind that of other forms of gaming such as videogaming (Yan & Randell, 2005). This segment centered on the wide variety of ways in which players can cheat, even in the same game (e.g., deliberate or unintentional procedural error, manipulation of dice, etc.). The sheer number of ways to cheat and underlying motives pose interesting challenges for modeling.

Researchers across the network highlighted the absence of a unified definition of human-like AI, which has been identified as a focus for future work within the GameTable action. The discussion helped surface different ideas of what "human-like" play means. The most common understandings of this (within the computer science community) are consideration of the empirical cognitive approach and limitations of the human mind (Gobet et al., 2004; Mandziuk, 2012); or of taking human game trajectories and training a policy to emulate these via direct supervised, imitation or inverse reinforcement learning, amongst possible techniques (Abbeel & Ng, 2004; Jacob et al., 2022; Lee et al., 2014). Incorporating humanities experts in the discussion broadened the scope of human-like out of the digital box and into a materialized instantiation of play. As with cheating, considering the material and social context of games between humans introduced other ideas such as sandbagging, sleight of hand as an active (and even admired) skill, mental or social fatigue, lack of familiarity with the rules (accidental cheating), ritual play, playing to belong, playing to learn, and the potential importance of aesthetically attractive board positions. A key takeaway is that human-likeness is best understood as a spectrum rather than a binary classification, broadly distinguishing between poor, average, and strong players rather than fine-grained skill levels, which includes more human approaches to social interaction and play, such as the ability to detect competency-based failure in opponents.

During the course of the meeting, a recurrent theme was the value of developing human-like AI approaches in collaboration with humanities scholars. Interdisciplinary work to develop more human-like play agents is important for humanities researchers because it will facilitate more robust metric generation with which to explore heritage games. On a deeper level, LEM's interdisciplinary approaches have been fruitful for both participating humanities researchers and AI researchers because they have provided a mechanism to reflect on the underlying assumptions and blind spots of both disciplines. For example, humanities researchers working with material culture often create typologies of material objects but do not as often attempt to develop systematic taxonomies of behaviour, and as a result, much important thick description of how and why people played in the past, and indeed in the present, is lost. Conversely, AI approaches often require highly rule-based approaches which means that key features of games, such as cheating, remain little explored. This last observation is especially interesting given the large number of different ways in which it is possible to cheat in many games; the diversity of possible cheating "methods" underlines the richness and complexity of modeling human-like play agents.

It was agreed that a subgroup drawing from across GameTable would collaborate on a vision paper about defining human-like AI in games to meet this important gap in the current literature.

3.3 After GameTable

With the GameTable COST Action entering its final grant period next year, members discussed potential future prospects beyond it. Researchers agree that the collaborative work that started as part of the COST Action should continue beyond it, as they felt that the cross-disciplinary platform between humanities and AI scholars was valuable to both communities. Among the possibilities envisioned were the application to larger grant applications, building on the proof of concept work, and capacity-building undertaken during GameTable, as well as a mention was made of Citizen Science projects. The latter would allow the involvement of nonscientific volunteers, which would be particularly suited for continued work on human-like AI.

Another point of discussion concerned the deliverables of the project. Currently, one of the stated goals of the GameTable COST Action is to improve the potential for reconstruction of historical games, but the relevance of this approach was questioned due to the difficulty of measuring its success. One alternative approach that was mentioned was the use of computerized approaches to promote cultural heritage, with the example of the game *Kingdom Come: Deliverance II*'s accuracy when it comes to their representation of historical evidence (e.g., salt exploitations present in the game, as well as characters featured in it, were designed and brought to life after consulting experts on the subject).

4 Conclusion

This paper summarized the main topics discussed during the February 2026 GameTable COST Action meeting. A central theme was the development of human-like AI and its potential impact on the computational study of games, particularly for deriving more realistic measures of gameplay such as drama, player advantage, and the role of chance. Discussions highlighted the lack of a unified definition of human-likeness across disciplines, motivating further work by a dedicated subgroup, including the preparation of a position paper on this topic.

The meeting also reinforced the importance of interdisciplinary collaboration between cultural heritage researchers and AI specialists. Several ongoing projects demonstrated the potential of such collaborations, while future efforts will focus on strengthening these links and improving dissemination, notably through the development of shared educational resources. Finally, the Prague meeting was followed by a smaller workshop in Berlin involving members from both communities, aimed at improving the Ludii website and Games Database (Crist et al., 2024b). This work seeks to make the dataset more complete and accessible, and to better support future research, particularly on human-like AI, which will require large amounts of data.

Acknowledgments

This article is based on work from COST Action CA22145—GameTable, supported by COST (European Cooperation in Science and Technology). We thank all the participants who attended and contributed to this meeting. The Ludus ex Machina project is supported by Schmidt Sciences (grant number 25-70261).

ORCID iD

Dennis JNJ Soemers  <https://orcid.org/0000-0003-3241-8957>

Funding

The authors received no financial support for the research, authorship and/or publication of this article.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Note

1. <https://www.loebclassics.com>

References

- Abbeel, P., & Ng, A. Y. (2004). Apprenticeship learning via inverse reinforcement learning. In C. E. Brodley (Ed.), *Machine learning, proceedings of the twenty-first international conference (ICML 2004)*, Banff, Alberta, Canada, July 4–8, 2004. ACM International Conference Proceeding Series. ACM. <https://doi.org/10.1145/1015330.1015430>
- Allis, L. V. (1994). *Searching for solutions in games and artificial intelligence*. Maastricht: Rijksuniversiteit Limburg.

- Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence, and J. T. Spence (Eds.), *Psychology of learning and motivation*. Psychology of learning and motivation (Vol. 2, pp. 89–195). Elsevier. [https://doi.org/10.1016/S0079-7421\(08\)60422-3](https://doi.org/10.1016/S0079-7421(08)60422-3)
- Courts, S. (2022). Divine and mortal gamblers: Good times in the Roman World. *Clio Women, Gender, History*, 56(2), 43–65. <https://shs.cairn.info/journal-clio-women-gender-history-2022-2-page-45?lang=en>
- Courts, S., Crist, W., Penn, T., Carè, B., Kovar, B., & Moullou, D. (2026). Replay: Computational heritage of games [Conference session]. *CAA 2026: Computer applications in archaeology, Vienna, Austria*.
- Crist, W., De Voogt, A., & Dunn-Vaturi, A.-E. (2016). Facilitating interaction: Board games as social lubricants in the ancient near east. *Oxford Journal of Archaeology*, 35(2), 179–196. <https://doi.org/10.1111/ojoa.12084>
- Crist, W., & Piette, E. (2025). Changing the Game: Measuring Mesopotamian games with AI-simulated play [Conference session]. *EAA 2025: European association of archaeologists annual meeting, Belgrade, Serbia*.
- Crist, W., Piette, É., & Browne, C. (in press). Playing the games of the past: Digital tools for resurrecting traditional board game. *The interactive past re-imagined: New horizons of video games*.
- Crist, W., Piette, É., Jeneson, K., Soemers, D. J. N. J., Stephenson, M., Van Goor, L., & Browne, C. (2026). Ludus Coriovalli: Using artificial intelligence-driven simulations to identify rules for an ancient board game. *Antiquity*, 100(409), 111–126.
- Crist, W., Piette, É., Soemers, D. J. N. J., Stephenson, M., & Browne, C. (2024a). Computational approaches for recognising and reconstructing ancient games: The case of Ludus Latrunculorum. In A. Pace, T. Penn, & U. Schädler (Eds.), *Games in the ancient world: Places, spaces, accessories* (pp. 63–79). Dremil-Lafage: Mergoil.
- Crist, W., & Soemers, D. J. N. J. (2023). The digital Ludeme project: Combining archaeological and computational methods for the study of ancient board games. *Journal of Archaeological Science: Reports*, 49, 104005. <https://doi.org/10.1016/j.jasrep.2023.104005>
- Crist, W., Stephenson, M., Piette, É., & Browne, C. (2024b). The Ludii games database: A resource for computational and cultural research on traditional board games. *Digital Humanities Quarterly*, 18(4).
- Finkel, I. (1991). La tablette des Règles du jeu Royal d'Ur. In *Jouer dans l'Antiquité* (pp. 154–155).
- Finkel, I. L. (2007). On the rules for the Royal Game of Ur. In *Ancient Board Games in Perspective* (pp. 16–32).
- Gaina, R. D., Balla, M., Dockhorn, A., Montoliu, R., & Liebana, D. P. (2020). TAG: A Tabletop Games framework. In *AIIDE Workshops*.
- Goadrich, M., Morenville, A., & Piette, É. (2026). Valet: A standardized testbed of traditional imperfect-information card games. <https://doi.org/10.48550/arXiv.2603.03252>.
- Gobet, F., Retschitzki, J., & de Voogt, A. (2004). *Moves in Mind: The psychology of board games*. Psychology Press.
- Jacob, A. P., Wu, D. J., Farina, G., Lerer, A., Hu, H., Bakhtin, A., Andreas, J., & Brown, N. (2022). Modeling strong and human-like gameplay with KL-regularized search. In K. Chaudhuri, S. Jegelka, L. Song, C. Szepesvári, G. Niu, and S. Sabato (Eds.), *International conference on machine learning, ICML 2022, 17–23 July 2022, Baltimore, Maryland, USA*. Proceedings of Machine Learning Research (pp. 9695–9728). PMLR. <https://doi.org/10.48550/arXiv.2112.07544>
- Kidd, S. (2017). Pente Grammai and the “Holy Line”. *Board Game Studies Journal*, 11(1), 83–99. <https://doi.org/10.1515/bgs-2017-0004>
- Kocsis, L., & Szepesvári, C. (2006). Bandit based Monte-Carlo planning. In J. Fürnkranz, T. Scheffer, and M. Spiliopoulou (Eds.), *Machine learning: ECML 2006, 17th European conference on machine learning, Berlin, Germany, September 18–22, 2006, Proceedings*. Lecture Notes in Computer Science (Vol. 4212, pp. 282–293). Springer. https://doi.org/10.1007/11871842_29
- Koriche, F., Lagrue, S., Piette, É., & Tabary, S. (2017a). Constraint-based symmetry detection in general game playing. In *Proceedings of the twenty-sixth international joint conference on Artificial Intelligence, IJCAI-17* (pp. 280–287).
- Koriche, F., Lagrue, S., Piette, É., & Tabary, S. (2017b). WoodStock : Un programme-joueur générique dirigé par les contraintes stochastiques. *Revue D'Intelligence Artificielle (RIA)*, 31(3), 307–336.
- Kovářík, V., Schmid, M., Burch, N., Bowling, M., & Lisý, V. (2022). Rethinking formal models of partially observable multiagent decision making. *Artificial Intelligence*, 303, 103645. <https://doi.org/10.1016/j.artint.2021.103645>
- Kreider, A. (2025). Cheating while playing (and cheating at playing). In C. Thi Nguyen & J. R. Sageng (Eds.), *The Routledge handbook of philosophy of games* (pp. 77–89). Routledge.
- Lee, G., Luo, M., Zambetta, F., & Li, X. (2014). Learning a Super Mario controller from examples of human play. In *Proceedings of the IEEE congress on evolutionary computation, CEC 2014, Beijing, China, July 6–11, 2014* (pp. 1–8). IEEE. <https://doi.org/10.1109/CEC.2014.6900246>
- Mandziuk, J. (2012). Human-like intuitive playing in board games. In T. Huang, Z. Zeng, C. Li, and C. Leung (Eds.), *Neural information processing—19th international conference, ICONIP 2012, Doha, Qatar, November 12–15, 2012, Proceedings, Part II*. Lecture Notes in Computer Science (pp. 282–289). Springer. https://doi.org/10.1007/978-3-642-34481-7_35
- Morenville, A., & Piette, E. (2024). Belief Stochastic Game: A model for imperfect-information games with known positions. In *Computer and games (CG)*. https://doi.org/10.1007/978-3-031-86585-5_14
- Morenville, A., & Piette, E. (2025). Modeling uncertainty: Constraint-based belief states in imperfect-information games. In *2025 IEEE conference on games (CoG)* (pp. 1–4). <https://doi.org/10.48550/arXiv.2507.19263>

- Piette, É. (2016). Une nouvelle approche au general game playing dirigée par les contraintes. PhD thesis, CRIL, Artois University, Lens, France.
- Piette, É., Crist, W., Soemers, D. J. N. J., Rougetet, L., Courts, S., Penn, T., & Morenville, A. (2024). Gametable cost action: Kickoff report. *ICGA Journal*, 46(1), 11–27. <https://doi.org/10.3233/ICG-240245>
- Piette, É., Morenville, A., Care, B., Moullou, D., & Crist, W. (2025). AI-powered game recognition: A collaborative dataset for traditional games [Conference session]. *CAA 2025: Computer applications in archaeology, Athens, Greece*.
- Piette, É., Soemers, D. J. N. J., Stephenson, M., Sironi, C. F., Winands, M. H. M., & Browne, C. (2020). Ludii—The Ludemic general game system. arXiv. <https://doi.org/10.48550/arXiv.1905.05013>.
- Piette, É., Stephenson, M., Soemers, D. J. N. J., & Browne, C. (2021). General board game concepts. In *Proceedings of the 2021 IEEE conference on games (CoG)* (pp. 932–939). IEEE. <https://doi.org/10.1109/CoG52621.2021.9618990>
- Powley, E. J., Cowling, P. I., & Whitehouse, D. (2017). Memory bounded Monte Carlo tree search. In B. Magerko, and J. P. Rowe (Eds.), *Proceedings of the thirteenth AAAI conference on artificial intelligence and interactive digital entertainment (AIIDE-17), October 5–9, 2017, Snowbird, Little Cottonwood Canyon, Utah, USA* (pp. 94–100). AAAI Press.
- Rautureau, A., Cazenave, T., & Piette, É. (2026). Generalized rapid action value estimation in memory-constrained environments. *arXiv preprint arXiv:2602.23318*. <https://doi.org/10.48550/arXiv.2602.23318>
- Rautureau, A., & Piette, E. (2025). CogniPlay: A work-in-progress human-like model for general game playing. <https://doi.org/10.48550/arXiv.2507.05868>
- Schädler, U. (1999). Damnosa alea—Würfelspiel in griechenland und rom. *Matthias Oberlechner (Bearb.)*, 5000, 39–58.
- Schädler, U. (2009). Pente Grammai—The ancient Greek board game five lines. In *Board game studies colloquium XI, Proceedings. Lisbon* (Vol. 173, p. 196).
- Soemers, D. J. N. J., Kowalski, J., Crist, W., Courts, S., Penn, T., & Piette, É. (2025). Bridging artificial intelligence (AI) and cultural heritage: Outcomes from the GameTable Working Group 1 (WG1) London meeting. *ICGA Journal: The Journal of the Computer Games Community*, 47(1), 41–47. <https://doi.org/10.1177/13896911251329543>
- Soemers, D. J. N. J., Kowalski, J., Piette, É., Morenville, A., & Crist, W. (2024). GameTable Working Group 1 meeting report on search, planning, learning, and explainability. *ICGA Journal*, 46(1), 28–35. <https://doi.org/10.3233/ICG-240251>
- Swift, E. V. (2017). *Roman artefacts and society: Design, behaviour and experience*. Oxford University Press.
- von Neumann, J., & Morgenstern, O. (1944). *Theory of games and economic behavior*. Princeton University Press.
- Yan, J. J., & Randell, B. (2005). A systematic classification of cheating in online games. In *Proceedings of the 4th workshop on network and system support for games, NETGAMES 2005, Hawthorne, New York, USA, October 10–11, 2005* (pp. 1–9). ACM. <https://doi.org/10.1145/1103599.1103606>