

## Editorial: Chess, Ludemes and Trees

Tristan Cazenave

*LAMSADE, Université Paris-Dauphine, PSL, CNRS, Paris, France*

*E-mail: Tristan.Cazenave@dauphine.psl.eu*

The first contribution to this issue is *An Upper Bound for the Number of Chess Diagrams without Promotion* by Daniel Gourion. It shows that the number of legal Chess diagrams is less than  $4 \times 10^{37}$  which is an improvement on the previous upper bound of  $2 \times 10^{40}$  by Steinerberger. The trick is to define a graph on the set of diagrams and to classify pawn arrangements.

The estimation of the number of Chess diagrams goes back to the seminal paper of Shannon in 1950. This is related to the work of Tromp on the number of legal Go positions. Tromp also recently investigated the number of legal Chess positions with a randomized algorithm. The code written by Gurion to compute the upper bound is available.

Cameron Browne, Éric Piette, Walter Crist, Matthew Stephenson, and Dennis J. N. J. Soemers report on the Second Digital Ludeme Project Workshop that was held at Maastricht University in April 2022. It deals with many topics including Digital Archaeoludology, Ludemes, Ludii, Education, Games, GGP and AI.

The first day of the workshop dealt with Digital Archaeoludology: presentations of the Digital Ludeme Project, discussions about recovering ludemes of ancient games, about the use of Ludii for education and about practical concerns. The second day dealt with the Ludii software and its use for modelling games. The third day was about reconstructing games with Ludii. The fourth day had presentations about game AI and General Game Playing.

At the end of this issue, Jonathan Schaeffer gives us a note about *(Game-)Tree Searcher Search* and computer Chess pioneers Monty Newborn and Ken Thompson.

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