Shall we play a game? Topological and abstract games

Bachelor thesis topic

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A topological game is a game with two players playing on a topological space with total information. An example of such a game is the *Choquet game* on a nonempty topological space X. Here two players, let's call them Eve and Odd, are playing nonempty open substest of X

Eve	U_0		U_1		...
Odd		V_0		V_1	...

where $U_0 \supset V_0 \supset U_1 \supset V_1 \supset \ldots$. Odd wins if the intersection of all V_i is empty, i.e if

$$\bigcap_{i=0}^{\infty} V_i = \emptyset.$$

The aim of this thesis is to study some examples of topological or abstract games with applications to analysis. These games include the *Choquet game* and the *Banach-Mazur game* for the charaterisation of Baire spaces, Polish spaces and comeagre sets, see Section I.8 of [1].

Moreover, the abstract Banach-Mazur game for the construction of the Gurariĭ space given in [2] should be included.

References

[1] Alexander S. Kechris. *Classical descriptive set theory*, volume 156 of *Graduate Texts in Mathematics*. Springer-Verlag, New York, 1995.

[2] Wiesł aw Kubiś. Game-theoretic characterization of the Gurarii space. *Arch. Math. (Basel)*, 110(1):53–59, 2018.