An Empirical Analysis of Prediction Markets

In recent years, many decentralised finance applications based on Etherum and other blockchains have emerged. One particular application class are prediction markets. These markets facilitate the prediction of future events through financial bets. While this concept is ancient, the recent surge of prediction markets has enabled forecasts on a much larger variety of events (concerning politics, economics, pandemics, natural disasters, military events, pop culture events, sports, ...). Many of these prediction markets use smart contracts to facilitate predictions, with the prices being determined by automated market makers (AMMs) or order books. The resolution of event outcomes can be performed by resolution oracles.

One prominent example of a decentralised prediction market is https://polymarket.com which is based on the resolution oracle https://umaproject.org. Other prediction markets are https://kalshi.com,https://predictit.org, https://manifold.markets, https://futuur.com, https://app.plotx.io, https://betmoose.com, https://polkamarkets.com, https://playdestiny.io, and https://insightprediction.com. While most of these markets use blockchain technology and/or AMM as a facilitator, it's important to note that many of them do not operate fully decentralised. Also noteworthy is the emergence of outsourced predictions without a market mechanism, with the most prominent platform being https://metaculus.com. Finally, there is a large number of already failed prediction market projects such as https://p2p.hedgehog.markets, https://totemfi.com, https://app.stox.com, https://omen.eth.link, https://pulsemarket.eth.link, https://augur.net, and https://sosmarket.io.

Many theoretical and practical questions arise in this quickly evolving context: How do the auctioning mechanisms work? How can liquidity be provided, especially for markets which are expiring soon or which are highly volatile? What resolution mechanisms exist? What are the game theoretic properties of (decentralized) prediction markets? What risks exist, e.g. from adversaries attacking resolution oracles or influencing real-world events? How are the underlying smart contracts implemented (where applicable)? How can transation costs be kept low? How do markets on similar topics compare between different platforms? What insights can we find from scraping and analyzing some of the data?

The goal of this student project is to gain insight into these questions and, where possible, contribute novel analysis or market mechanisms to the research area.

Contacts

- Lioba Heimbach: hlioba@ethz.ch, ETZ G95

- Quentin Kniep: qkniep@ethz.ch, ETZ G95

- Robin Fritsch: rfritsch@ethz.ch, ETZ G63