

Polished title

OrVisZM3P: Bridging MetaTrader's (MT5) MetaQuotes Language's (MQL5) API with ZeroMQ for Real-Time Microsecond Bid/Ask Orderflow Data Extraction and Visualization Across Rust, Go, C++, Python, Java, C#, and NodeJS

Or — orderflows in bid/ask form

Vis – Visualization after microsecond extraction

Z - means ZeroMQ binding to bridge between the MQL5 API to another programming languages

M - means MetaTrader's (MT5) MetaQuotes Language's (MQL5)

3 - three combination (eg. rust + zmq + mql5)

P - the programming languages (Rust, Go, C++, Python, Java, C#, and NodeJS)

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Draft. Overview Title

Binding MT5's MQL5's API: Exploiting Real-time Microsecond live trading data from MetaTrader (MT5) using ZeroMQ bound to MetaQuotes (MQL5) Expert Advisor, bridging 3 combinations to programming languages of either such as Rust, Go, C++, Python, Java, C#, NodeJS to extract and visualize developing Bid/Ask Orderflows in an external UI chart application.

MT5Flow

Exploiting Real-time Microsecond Bid/Ask Orderflows data from MetaTrader 5 Using Rust, ZeroMQ, and MetaQuotes Language (MQL5)

At the time of writing, there is no publicly known approach using Rust, ZeroMQ, and MetaQuotes Language (MQL5) combination to exploit real-time microsecond bid/ask orderflows data from MetaTrader 5, before this implementation. This study will show a new approach to extract and visualize the developing microsecond bid/ask formation with a low-latency phase. We used MT5's API to fetch real-time live trading data, bound to ZeroMQ & Expert Advisor MQL5 integration, and Rust as an external processor to generate fast-phase developing bid-ask orderflow visualization through a simple chart.

At the time of writing, it's really hard to find benchmark research papers since no one is interested in binding MT5's API using a ZMQ bridge to other programming languages such as Rust, Go, C++, and Python (creating a combination of 3). We search across the internet using 9 AI leading platforms, namely Grok, Gemini, Claude, ChatGPT, MSCopilot, Perplexity, Baidu

(Ernie Bot), DeepSeek, and Qwen (1, 2, 3, 4, 5, 6, 7, 8, 9). Some of the AI's responses end up hallucinating, suggesting a combination of 2, and not the strictly 3, but later been clarified and confirmed that there are no public projects yet to implement before this. We also searched across four scholarly libraries, such as Arxiv, Google Scholar, SSRN, and Baidu 学术 (10, 11, 12, 13). The lack of literature suggests that this study's approach (specifically using MT5's MQL5 API to fetch live-trading datafeed from its connected Broker) is bound to ZMQ, bringing the other programming languages are not that popular and not well explored.

Detailed ZMQ (The DLLs require that you have the latest Visual C++ runtime (2015).) binding to MQL - <https://github.com/dingmaotu/mql-zmq> (14)

ZMQ binding to Rust - <https://github.com/zeromq/zmq.rs> (15)

ZMQ binding between MQL and JavaScript - <https://github.com/EricSchles/bindings-mql4-5> (16)

We used this repository to train (be-aware) locally our Gemini Pro inside Google Antigravity to analyze and have a benchmark of what has been proven to work so far. This approach is similar to training LLMs using open-source repositories to generate source code. Such as Proposes *RepoMark*, a framework to audit whether a code repository has been used in training a code large language model, addressing transparency and license compliance concerns in training on open-source projects (17). Investigates whether a given model has *actually used* specific code from public repositories in its training data via membership inference, providing methods for detecting code inclusion (18). By being mindful of regulatory concerns (19) and following practices (20). With that being said, Gemini Pro already has access to the internet.

MetaTrader 5 (MT5)

MetaTrader 5 (MT5) is a multi-asset trading platform developed by MetaQuotes Software and launched in 2010. It is designed to facilitate trading in various markets, including Forex, stocks, futures, and CFDs. (21). It supports connecting to a regulated broker (22)

MetaQuotes Language 5 (MQL5) [MQL5 Reference – How to use algorithmic/automated trading language for MetaTrader 5](#) (23)

[MQL5 API Common APIs - MQL5 Programming for Traders](#) (24)

Methodology

Combination of

- | | | |
|---|--------------------------|------|
| A | Rust, ZeroMQ, and MQL5 | RuZM |
| B | Go, ZeroMQ, and MQL5 | GuZM |
| C | C++, ZeroMQ, and MQL5 | C+ZM |
| D | Python, ZeroMQ, and MQL5 | PyZM |
| E | Java, ZeroMQ, and MQL5 | JaZM |

F	C# , ZeroMQ, and MQL5	C#ZM
G	Node.js, ZeroMQ, and MQL5	NoZM

Make a software application for those combinations and make a simple bid/ask exploit. Download CSV files, run all software at once using the same ZMQ socket. Compare using a correlation matrix to see how well (in %) does the developing bid/ask formation correlate to each other.

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Both historical and recent practices fetch trading-data from various platforms to develop trading strategies. These platforms with accessible APIs are not designed for trading purposes but mainly to analyze portfolios and trading trends, namely *Yahoo Finance & Twitter*'s data is used for Long-Short Term Memory neural network (LSTM) modeled time series analysis (1), *Alpha Vantage* for Naive Bayes machine learning algorithm for predicting stock prices (2), *Finnhub* is used as part of a large-scale Financial News and Stock Price Integration Dataset (FNSPID) model for time series financial analysis (3), *Massive* (was Polygon.io) to aggregate news articles (4), *IEX Cloud* to retrieve real-time stock data to predict stock prices (5), *SimFin*'s balance sheet data for machine learning fundamental analysis to predict stock prices (6), *Quandl*'s dataset as a part of alternative data and sentiment analysis (7). And consideration of the cryptocurrency side, namely *CoinGecko*'s databases (8), *CryptoCompare*'s datasets for real-time data architecture (9), *BraveNewCoin*'s daily prices datasets for analysis of the entry and exit dynamics of the cryptocurrency market (10), *Twelve Data*'s datasets for quantitative analysis for Stocks and Cryptocurrencies (11), *Messari*'s datasets for style investing (12), *Glassnode*'s dataset for Bitcoin price direction prediction using on-chain data and feature selection (13). Some of these platforms do offer forex-based datasets, which are also used for studies, such as

from *Yahoo Finance*'s datasets for forecasting with feature-augmented multivariate LSTM models ([14](#)), *Alpha Vantage*'s dataset for trend prediction using machine learning ([15](#)), Finnhub's API for

And many more platforms with API access for trading datasets. Although it is widely used for trading analysis and machine learning modeling, those platforms do not offer a trade-executable APIs. Scholars are studying to create strategies, but they are not mainly for live deployment purposes, that is why we argue that that's the reason why these models may fail in live environment since their datasets itself for modeling/practicing doesn't have trade-executable API. If we

Financial Modeling without the aim to implement it on live environment sucks.

Trading with two completely different platforms, one connected with the dataset API and one with connected has trade-execution API, may cause mispricing or misalignment of prices. It was forecast and perfectly fine to have a stoploss of 2R, but the broker had the ad ada dip a few ticks below what was in the charting platform.

2 arguments: (1) They conduct model construction using datasets from platforms that don't have trade-executable API support, meaning they just model and never meant to make it implement on live. (2) Modeling using two completely different platforms, one is for charting and one for trade execution, may cause a misprice alignment that may lead to unfortunate losses even if run in real-time. Was modeled perfectly, but failed with a few ticks on live.

The great example of this is TradingView same assets

There are many scholarly studies besides what was mentioned above, with the use of platforms to access financial datasets to model their trading strategies, but the use of those platforms is almost irrelevant for 'live-trading', at least for lower timeframe trading (we are not specifically referring to HFTs trading). It's magnificent to design these machine learning based technologies but they often fail in live trading, simply because they analyze inside a dataset providers or chart platforms and if they place a trade from completely different place, then there would be a mispricing alignment. Not only that,

Unlike Binance, which has an externally accessible API for trade execution, brokers such as vlavlavlavlavlavlavlav does not support that kind of API. But Metatrader addresses the issue. Metatrader has limited use as its native language was MQL built after C++, as of now at the time of writing, MT5 API is not that popular in scholarly studies for research, some claimed that it's due to old-like version bits haven't, this study will implement a unique approach of exploiting data. Less popular is the use of MetaTrader5 python library for developing trading studies.

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