Liquidity Services Electronic Trading

Time to ADAPT

ADAPTIVE

A Revolution in Algorithmic Trading

CLSA Algorithmic Trading platform is now supercharged with the latest Artificial Intelligence technology. By integrating Artificial Intelligence into the CLSA Algorithmic Trading engine we are transforming execution to take a more discreet, proactive and adaptive approach to trading.

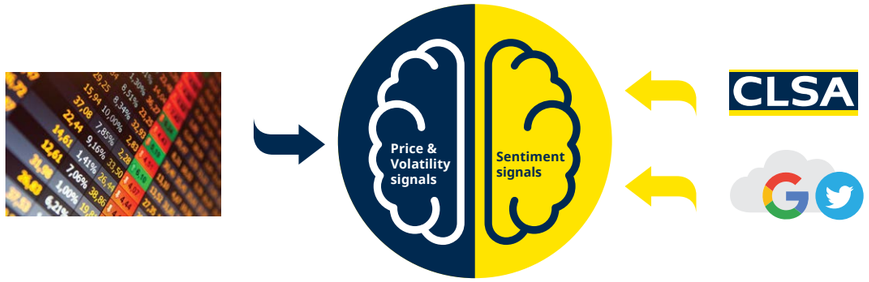
ADAPTIVE Intelligence

CLSA's **ADAPTIVE**, a revolution in Algorithmic Trading integrates the latest AI machine learning technology with contextual news and research. The supercharged CLSA Algorithmic Trading platform now enables our clients to take a more proactive and adaptive approach to execution. As non-traditional market participants continue to exert their influence on the Asian trading landscape, CLSA's **ADAPTIVE** levels the playing field for our clients in an ever-changing and increasingly volatile trading environment.

Anatomy of ADAPTIVE

CLSA's **ADAPTIVE** leverages the Neural Network; the machine learning technology behind 'The Brain' which utilises both public and proprietary data sources to train itself to identify volatility and predict intra-day price movements simultaneously. Real-time trend momentum evaluation is supported by confidence levels and intensity screening of predicted price trend.

Live news feed analysis powered by a Natural Language Processing engine allows **ADAPTIVE** to detect and react to momentum shifts as they occur. Using diverse data sources including Bloomberg, Google Finance, Twitter and CLSA's award-winning research, 'The Brain' classifies data into five different sentiment levels applying contextual interpretations to live markets.



Implications for Algorithmic Trading Strategies

Increasingly volatile markets require accurate, effective and timely analysis of both data and momentum.

CLSA's **ADAPTIVE** addresses these requirements in order to ensure our clients remain on the front-foot as markets move, whilst easing the impact from disruptive non-traditional market participants. By differentiating between long-term sentiment changes and short-term momentum moves, CLSA Algorithms take advantage of not just momentum moves but also mean reversion.

ADAPTIVE generates price trend signals and performs real-time volatility clustering (measurement) for decision making. It also predicts short-term price, volume and price target (e.g. VWAP projection) to adjust strategies' behaviour. Every signal is characterised by a confidence level and intensity based on real-time trades.

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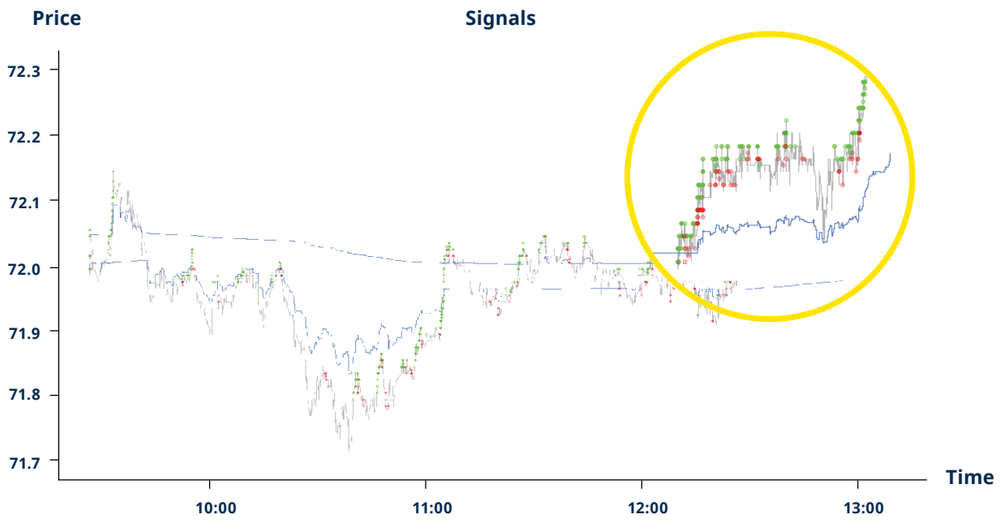
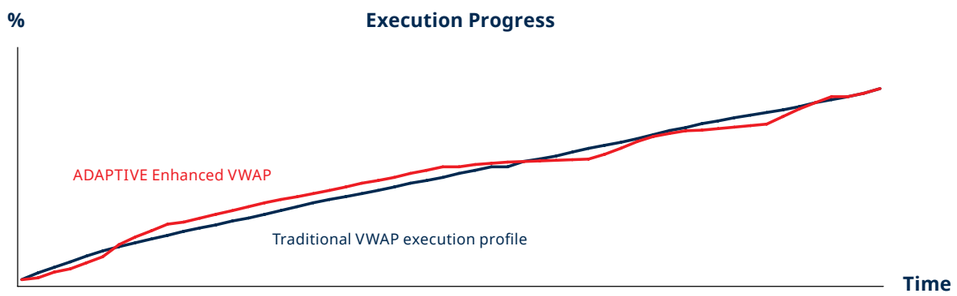
ADAPTIVE Strategies

ADAPTIVE VWAP

With **ADAPTIVE**, strategies such as VWAP no longer need to stick to a traditional time-based fixed slicing schedule. It now reacts to real-time market price and volume movements. Price and volatility signals enable VWAP strategy to capture small price misplacements in the market. With a dynamic view of future forecast volumes and price levels, **ADAPTIVE** VWAP achieves outperformance with reduced risk.



The analytical engine generates trend signals characterised by intensity based on real time trades. It also constructs a volatility band (the blue lines) around the stock price, highlighting normal vs. abnormal (favourable or unfavourable swings) volatility.

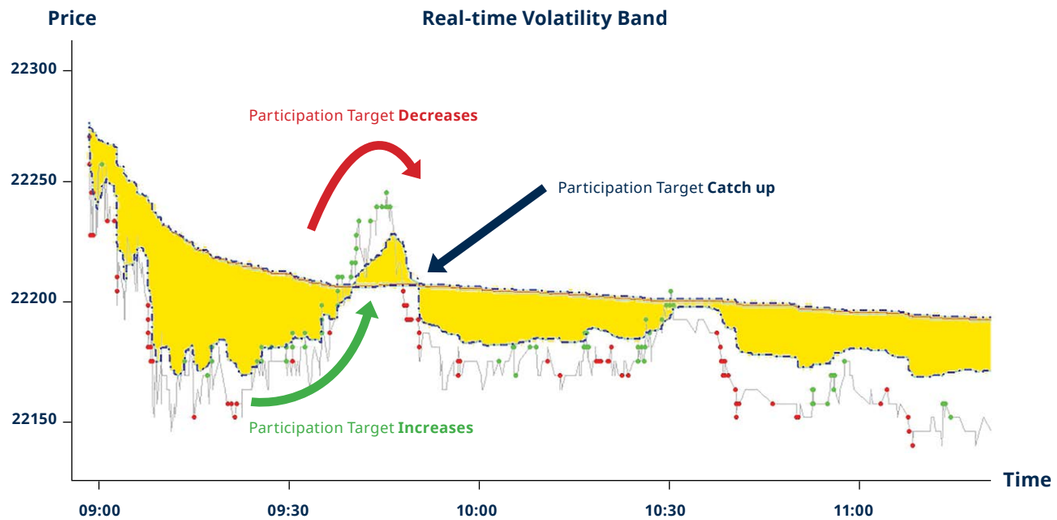


Traditional VWAP execution profile (blue line) vs. ADAPTIVE Enhanced VWAP (red line) trading around the VWAP curve based on ADAPTIVE signals.

ADAPTIVE Inline

ADAPTIVE's signal detection, price and volume projection science puts Alpha into Inline strategies.

Compared to a pure volume reactive Inline strategy, the new **ADAPTIVE** Inline differentiates momentum and mean reversion scenarios, allowing the algorithm to adjust trading patterns to optimise execution performance.



ADAPTIVE Inline Algorithm

To optimise execution **ADAPTIVE** Inline manages the overall participation rate of the order within trader defined aggression bands.

ADAPTIVE Inline calculates participation targets based on short-term predicted price, real-time volatility and price signals. The same price level at different times and market situations can result in a variable participation target. **ADAPTIVE** Inline trades up to the top of its range ahead of adverse moves, slowing down during the adverse, allowing for catch-up post reversion price moves.

ADAPTIVE Benchmark for Dynamic Strategy

Dynamic strategy, CLSA's most popular participation rate algorithm, is empowered with **ADAPTIVE**'s short-term price prediction model. Dynamic alternates between two volume participation rates based upon not just a real-time benchmark but a prediction benchmark anticipating where the stock price will go within the next few minutes. **ADAPTIVE** Benchmark works best in high volatility and strong momentum market conditions by predicting the best available target price.