

PROJECT LAB

Winter, 2025

AGENDA

Presenter's Bio

Project A

Project B

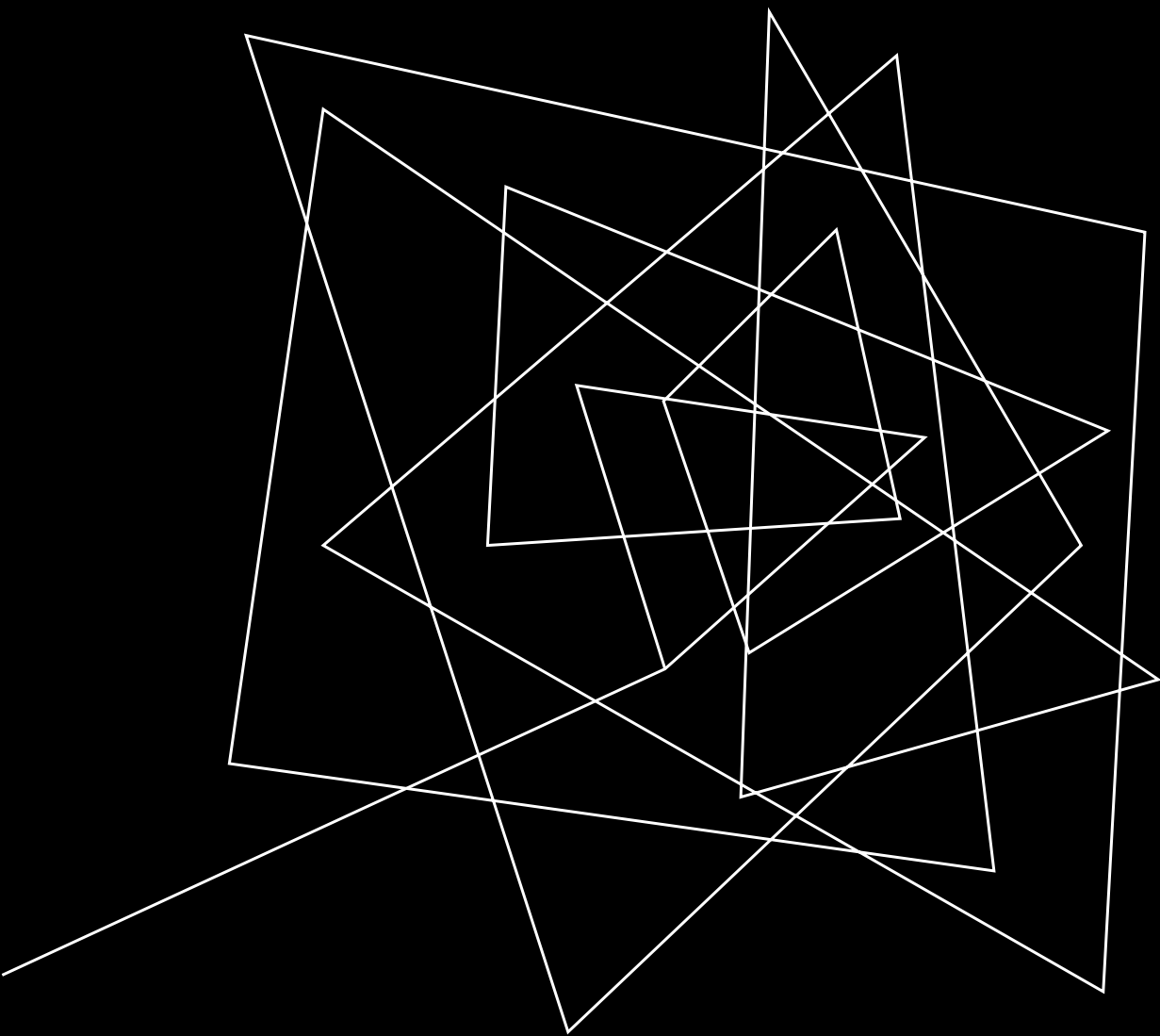
BIO

2017: MS in Financial Mathematics, University of Chicago

2018: Hired as cross-asset Quant for Principal Financial Group (Iowa, US) through a listing on FinMath job portal

2019-2022: Principal International, Santiago, Chile

2022-Present: Principal Asset Management, KL, Malaysia



SYSTEMATIC TECHNICAL ANALYSIS

Project A



SYSTEMATIC TECHNICAL ANALYSIS

MOTIVATION

1. **Profitability:** Augment directional bets with entry/exit rules
2. **Scale:** Application to a wide range of assets and sub-assets
3. **Efficiency:** Automation of investment workflow

LEARNING FOR STUDENTS

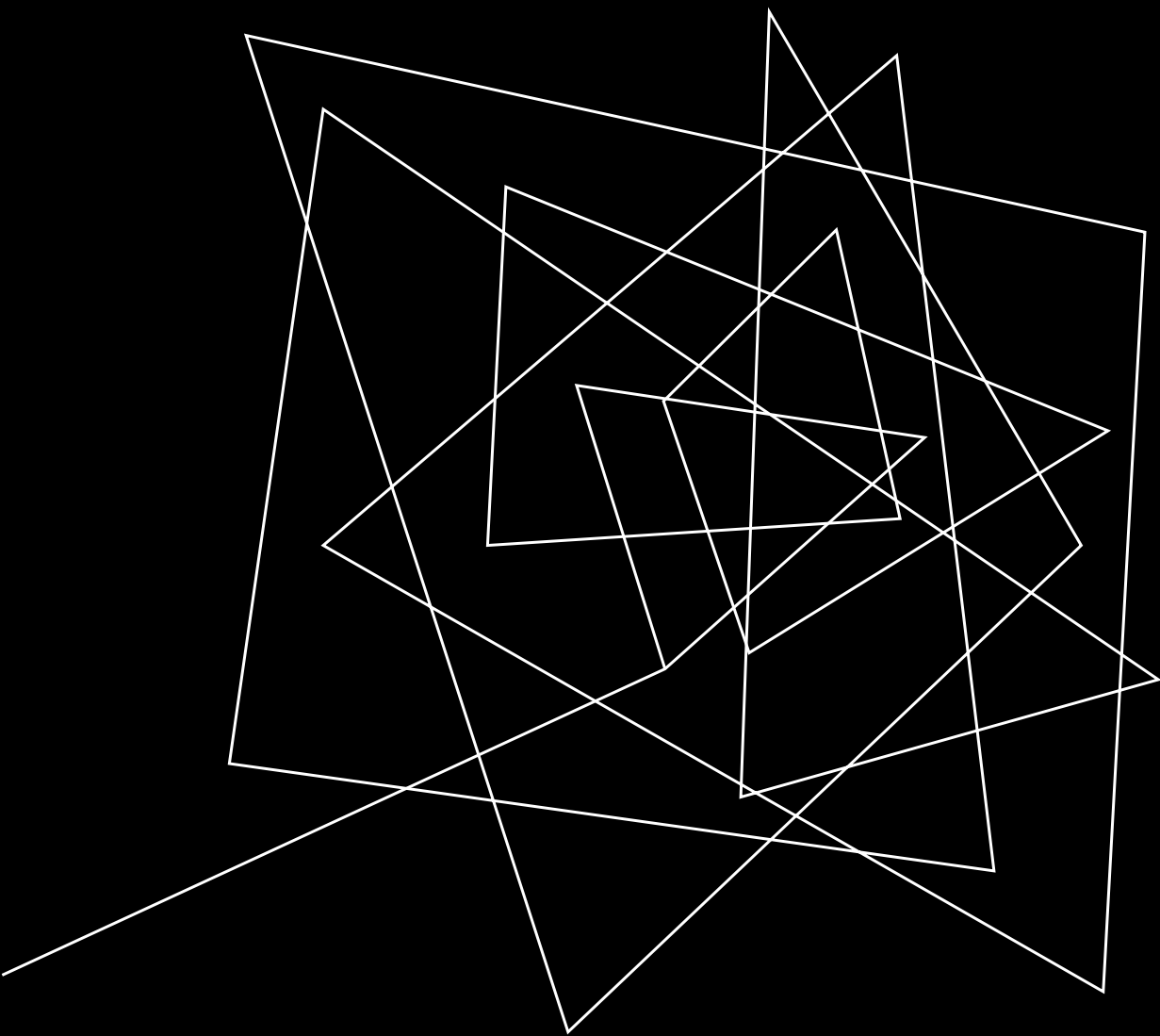
1. **Asset Pricing:** Understand standard models of asset pricing: Black-Scholes SDE, Heston and Bates model
2. **Bloomberg:** Understand functions such as GP, BT, EQS, EQBT, FTW
3. Practical applications and limitations of asset-pricing model and Bloomberg functions

EXPECTATIONS/DELIVERABLES

1. **Back-testing:** Define and backtest strategy based on Bloomberg trender for variety
2. **Identify pitfalls:** Mathematically, characterize pitfalls of trender signal
3. **Iterate and improve**

ILLUSTRATION: TRENDER STUDY ON GOLD (XAU CURRENCY)





INTERACTIVE ASSET ALLOCATION

Project B



INTERACTIVE ASSET ALLOCATION

MOTIVATION

1. **Hyper-customization:** Construct portfolio suiting individual investment needs and risk appetite
2. **Efficiency:** Automating portfolio construction process

LEARNING FOR STUDENTS

1. **Systematic portfolio construction:** Understand importance of estimating returns, risk and correlation for achieving target returns/risk. Consequently, understand different portfolio construction techniques: MVO, risk-parity, etc.
2. **ChatGPT/Claude:** Use LLMs for building prototypes

EXPECTATIONS/DELIVERABLES

1. **Survey questionnaire:** Interactive questionnaire to understand investor profile and needs. Responses to be recorded from natural language (desirable) or preset inputs
2. Develop a mechanism to convert qualitative information to quantitative
3. Build an interface that connects with portfolio construction module

ILLUSTRATION: INTERACTIVE APPLICATION USING LLM

Claude

Interactive Asset Allocation Advisor

RK Claude: Design an interface for interactive asset allocation app. At the outset, it should survey the investment goals, financial background and risk appetite with intuitive and engaging questions and suggest a portfolio mix suiting the investor needs and profile.

</> Interactive Asset Allocation Interface

Click to open component

Key features:

- Multi-step survey with slider inputs
- Dynamic portfolio allocation based on risk score
- Interactive pie chart visualization
- Responsive design with shadcn/ui components
- Progress tracking and navigation

Would you like me to adjust the questions or allocation logic?

Copy

Retry

Claude can make mistakes. Please double-check responses.

Reply to Claude...

Claude 3.5 Sonnet Concise

Interactive Asset Allocation Interface

Recommended Portfolio

Asset Class	Allocation
Bonds	40%
Large Cap	35%
Mid Cap	15%
Small Cap	10%

Investment Summary

Based on your 30 year age, 5 year investment horizon, and risk tolerance level of 5/10, we recommend the above portfolio allocation.

Start Over

Last edited just now

Publish



THANK YOU

Rajat Kathuria

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