Level	Atumation for portfolio	Method	
Level 1	Rule-based portfolio	1. Rule	Automatiation based on human obervation
Level 2	AI for rule-based portfolio	1. Machine learning-based prediction, 2. Rule-based allocation	Automatic portfolio based on data
Level 3	AI for optimal portfolio	1. Machine learning-based predcition, 2. Single-period optimization	Control portfolio for a target, at present
Level 3	AI for life-cycle portfolio	1. Machine learning-based prediction, 2. Multi-period optimization	Condier peronsal sitionation. Control portfolio over lifetime

Step	Portfolio	Method	Automation
Step I	Rule-based portfolios	• Rule	• Automatically control portfolio based on rule from human observation.
Step II	AI for rule-based portfolios	• Machine learning-based prediction • Rue-based portfolio	• Automatically control portfolios based on financial data. • Investor intervenes in unexpected risk.
Step III	AI for optimal portfolios	• Machine learning-based prediction • Single period optimization	• Automatically control portfolios for a target at a time origin. • Investor intervene is not need.
Step IV	AI for life-cycle portfolios	• Machine learning-based prediction • Multi-period optimization	• Automatically control portfolios for a target over a personal life. • Investor intervene is not need.

Level of prediction accuracy

Prediction plus
multi-period optimization

Prediction plus optimization

Prediction plus rule-based

Rule-based

Portfolio models

Prediction accuracy

Financial factors

- Trading data
- Technical data
- Macro data
- News
- Accounting data

- Trading data
- Technical data
- Macro data
- Accounting data

- Trading data
- Technical data

- Trading data

- Historical average