

MICHIGAN STATE

U N I V E R S I T Y

Alpha Presentation

Investment Portfolio Construction

The Capstone Experience

Team Principal IPC

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*From Students...
...to Professionals*

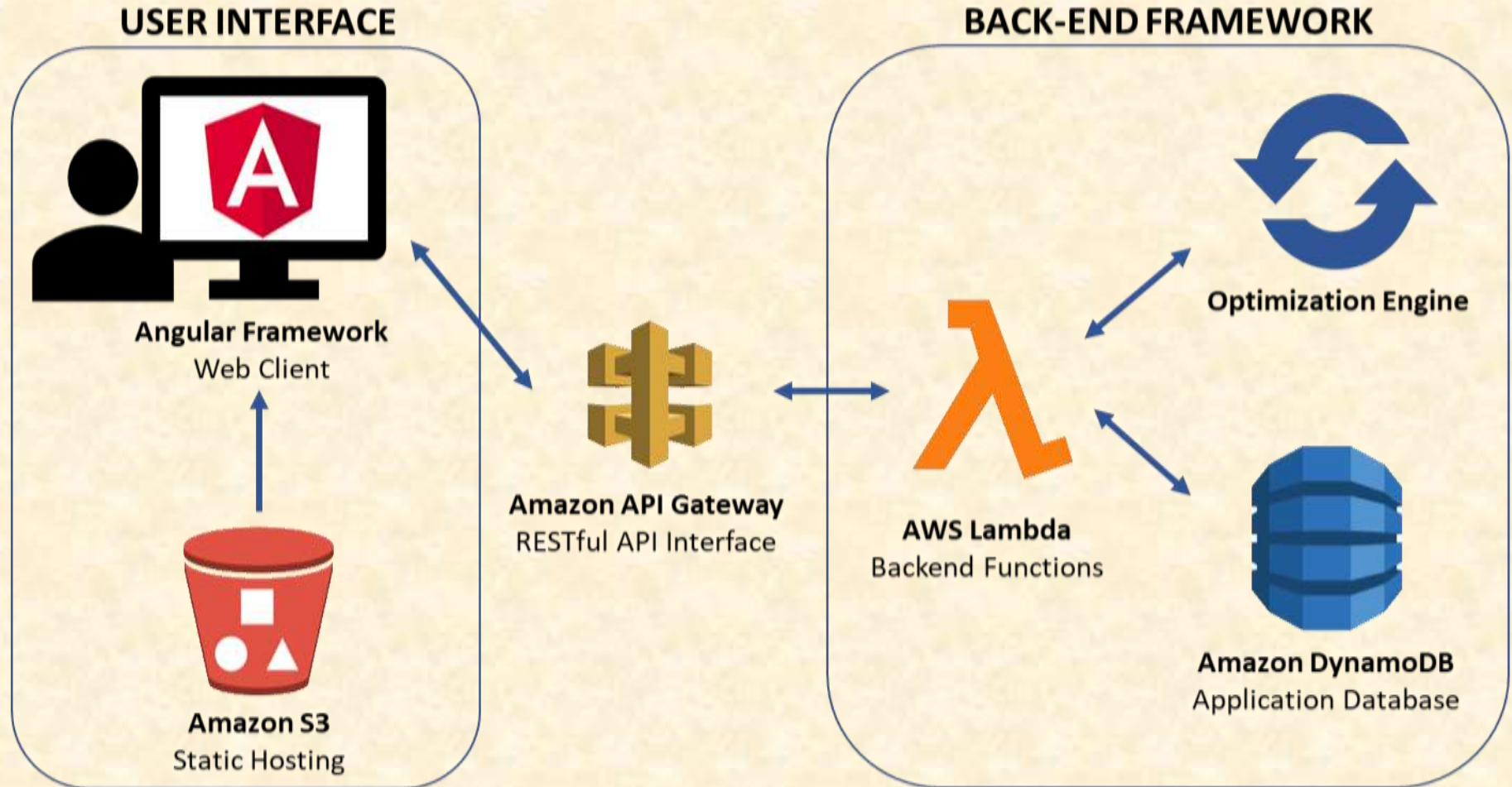
Department of Computer Science and Engineering
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Project Overview

- Principal's current process involves hard-coding parameters to generate a single type of investment portfolio construction
- Our application provides a user interface for saving and loading optimization parameters and passing them to Principal's existing optimization engine
- The application assigns groups to its users, providing them with the ability to construct a variety of portfolio constructions based on custom-built portfolio-level and quantile-level constraints



System Architecture



Home Page

Principal

Link John Doe

Scenarios Save Scenario: minimalConstraintScenario Role

Home Scope Specs Results

Create New Constraint Set

Name: techHeavy Description: Constraint set that favors technology sector + Generate Constraint Set

Load Recently Saved Constraint Sets

Name	Date	Description
narrowSectors	2-17-2020	Narrow constraints on individual sectors
stockQuantiles	2-17-2020	Quantile on stock signals

Load Delete

Load Recently Saved Results

Name	Date	Description
narrowSectorsResults	2-17-2020	Results from narrowSectors constraint set

Load Delete

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Constraint Scoping Page

The screenshot shows the Principal Constraint Scoping Page. At the top, there is a blue header with the Principal logo on the left and 'Link John Doe' on the right. Below the header, there are two buttons: 'Scenarios' and 'Save'. The current scenario is 'minimalConstraintScenario' and the constraint set is 'techHeavy'. A 'Role' dropdown menu is also visible.

The main content area has four tabs: 'Home', 'Scope', 'Specs', and 'Results'. The 'Scope' tab is active. Under this tab, there are four dropdown menus: 'Select Level' (set to 'Stock'), 'Select Type' (set to 'Quantile'), 'Select Signal' (set to 'DRP'), and 'Weighting Method' (with radio buttons for 'Absolute' and 'Benchmark', where 'Benchmark' is selected). A green '+ Add Constraint' button is located to the right of these dropdowns.

Below the dropdowns, there are three panels, each with a table and a 'Delete' button:

- Grouping Constraints:**

Type	Weight
MCAP	Absolute
Sector	Benchmark
- Stock Constraints:**

Type	Signal	Weight
Quantile	DRP	Benchmark
- Portfolio Constraints:**

Type	Weight
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At the bottom of the page, there is a footer with contact information: '800-986-3343' and 'Contact Us'. Below that, there are links for 'Terms of Use', 'Disclosures', 'Privacy', 'Security', 'Report Fraud', and 'Site Map'.

Constraint Specification Page

The screenshot displays the Principal application interface for constraint specification. The top navigation bar includes the Principal logo, a user profile for John Doe, and buttons for Scenarios, Save, and Role. The main content area is divided into four tabs: Home, Scope, Specs, and Results. The Specs tab is active, showing three constraint panels: Grouping Constraints, Stock Constraints, and Portfolio Constraints.

Grouping Constraints

Type	Weight	
MCAP	Absolute	✓
Sector	Benchmark	✓

Sector

Technology

Weight Range

Min value: 0.13

Max value: 0.18

0.13 ————— 0.18

Benchmark

Stock Constraints

Type	Signal	Weight	
Quantile	DRP	Benchmark	✓

Quantiles

Strategy: Very Loose

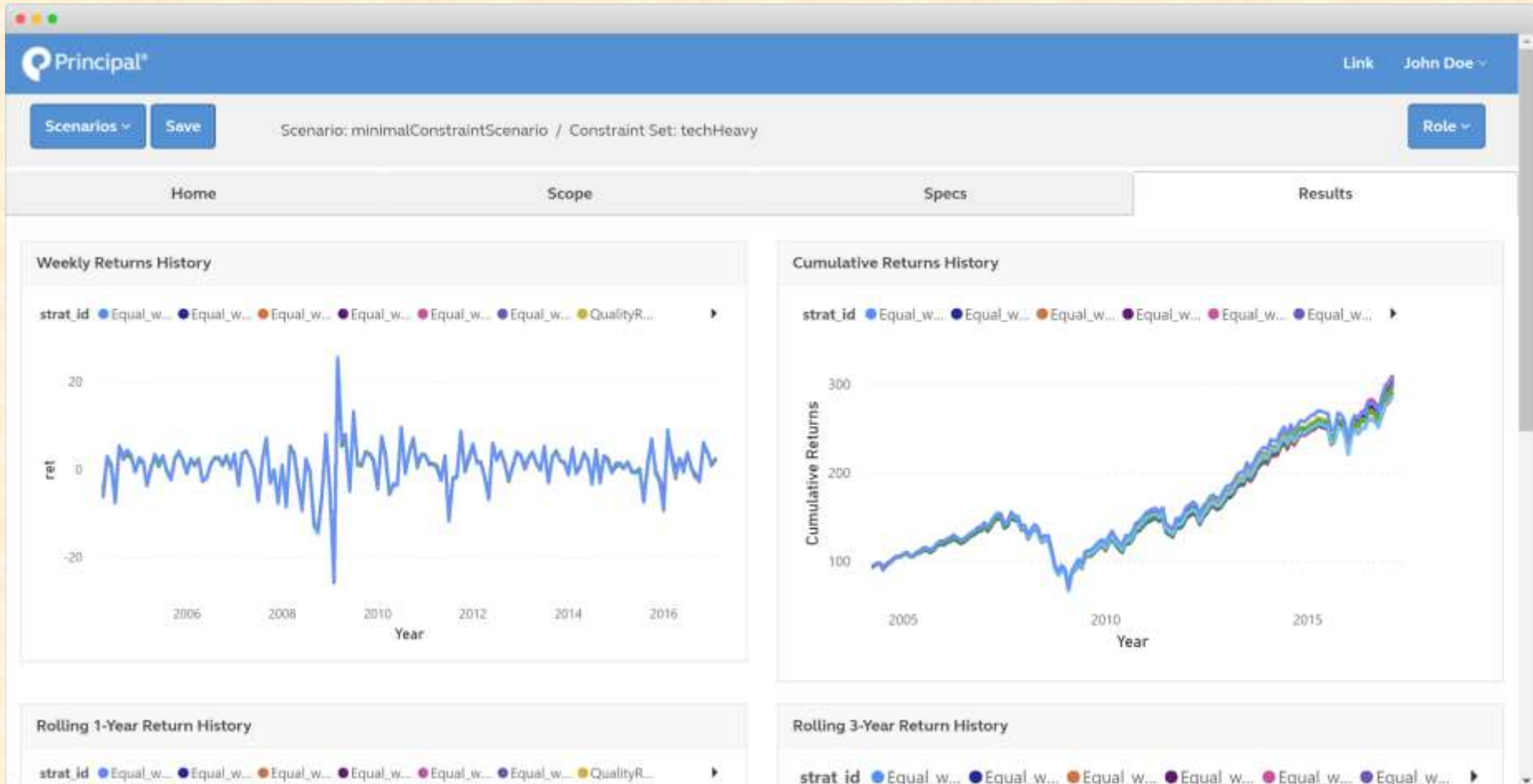
	Min		Max
Q1	0	+ ▼ Wbj	0.1 + ▼ Wbj
Q2	0	+ ▼ Wbj	0.1 + ▼ Wbj
Q3	0	+ ▼ Wbj	0.1 + ▼ Wbj
Q4	0	+ ▼ Wbj	0.1 + ▼ Wbj
Q5	0	+ ▼ Wbj	0.1 + ▼ Wbj

Portfolio Constraints

Type	Weight
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Results Page



What's left to do?

- Finish results page by generating a graphical summary of the data format received from the optimization engine
- Create “Admin” page for defining constraint conditions for different world views
- Create interface and logic for navigating between scenarios and world views based on user permissions
- Implement component for checking the feasibility of a constraint set prior to sending it to the optimization engine



Questions?

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