SoHardToName Team

Challenge: 2

Team Members

YuKai Qiao (**UQ** Master of CS)

- Recent Experience
  - Analyse DOTA Game

Remi Xu (**UQ** Bachelor of IT)

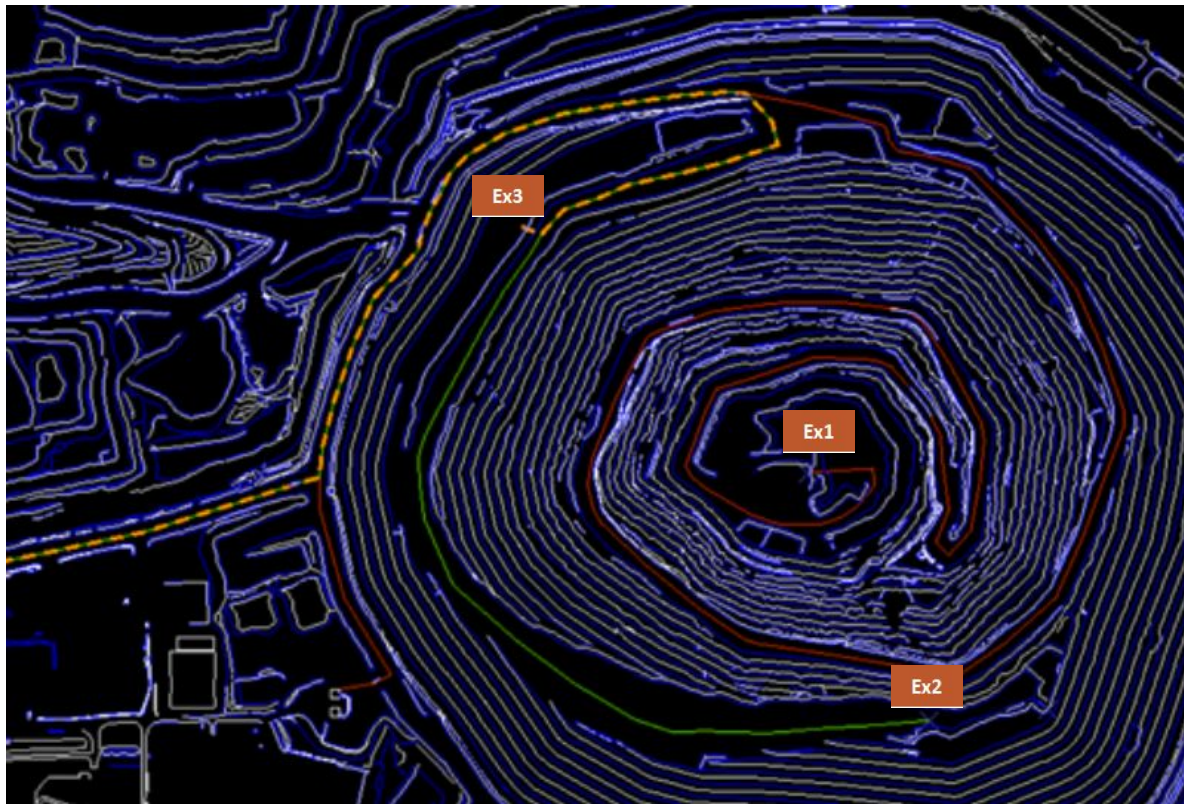- Recent Experience
  - Identify Facial Expression

Problem

Problem Statement

- The more ore they take, the slower they move.

- We need to **optimise** the productivity.

Challenge

- There is a trade off
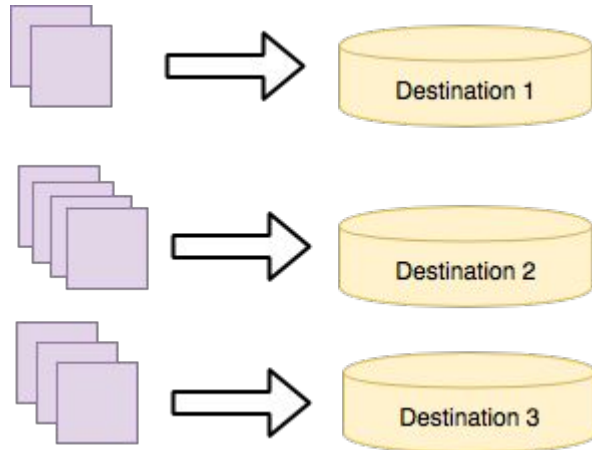 - payload vs cycle time

Excavator Locations

Approach-Two Parts

❖ Use data provided by Evolution Mining

➢ estimate cycle time vs. payload

❖ Offer optimal settings to maximize total productivity

➢ payloads settings

➢ truck arrangements settings

Solution-Optimise Productivity

Genetic Algorithm

Trucks

Destination 1

Destination 2

Destination 3

- Provide optimal truck schedule
- Maximize the utilization of excavators

Example Solutions

Excavator 1

- Payload
  - **206** tonnes
  - Current target 186 tonnes
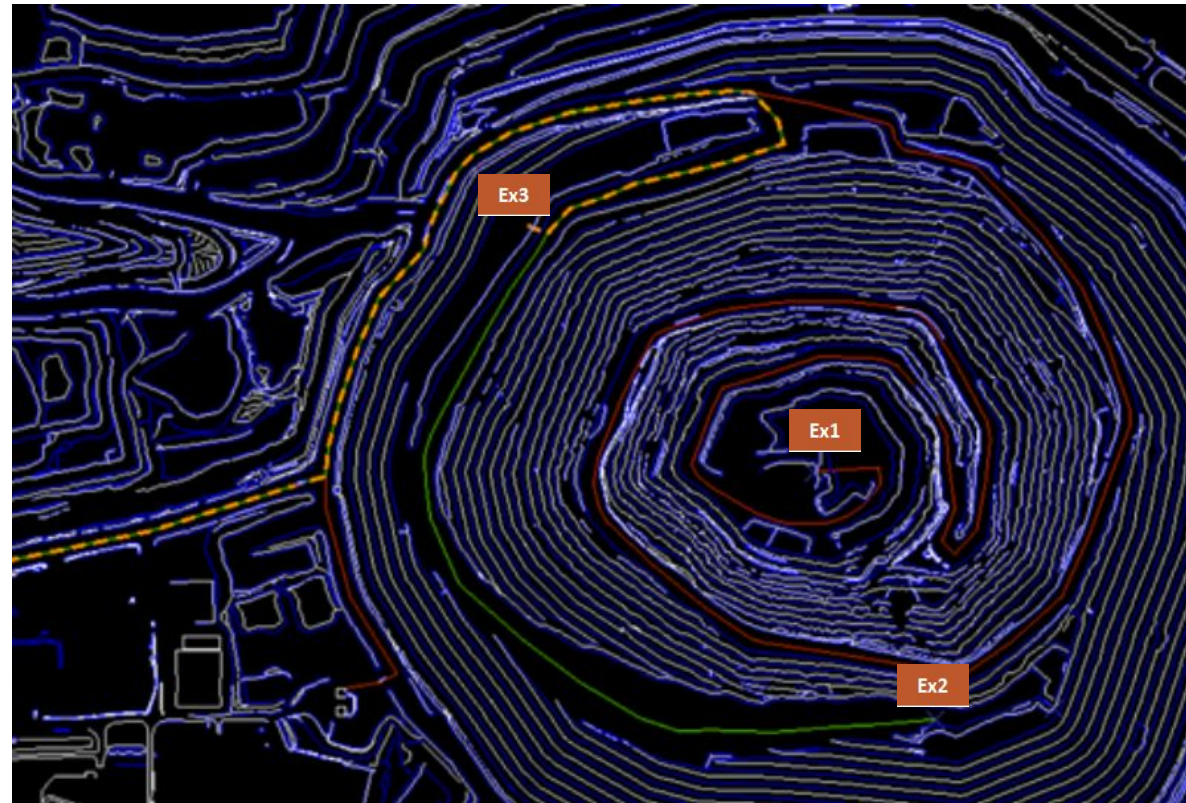- Trucks
  - 4

Excavator 2

- Payload
 - **206** tonnes
  - Current target 186 tonnes
- Trucks
  - 7

Excavator 3

- Payload
  - **206** tonnes
  - Current target 186 tonnes
- Trucks
  - 5

Estimated Productivity: 4817t/hours

Excavator Locations

Scenario	Excavator 1	Excavator 2	Excavator 3
1	840RL	1101RL	1173RL
2	831RL	1101RL	1173RL
3	831RL	1083RL	1064RL

Example Solutions–Weighted

Digging GOLD!!!

Excavator 1

Excavator 2

Excavator 3

- Payload
  - **206** tonnes
  - Current target 186 tonnes
- Trucks
  - 8

- Payload
  - **206** tonnes
  - Current target 186 tonnes
- Trucks
  - 3

- Payload
  - **206** tonnes
  - Current target 186 tonnes
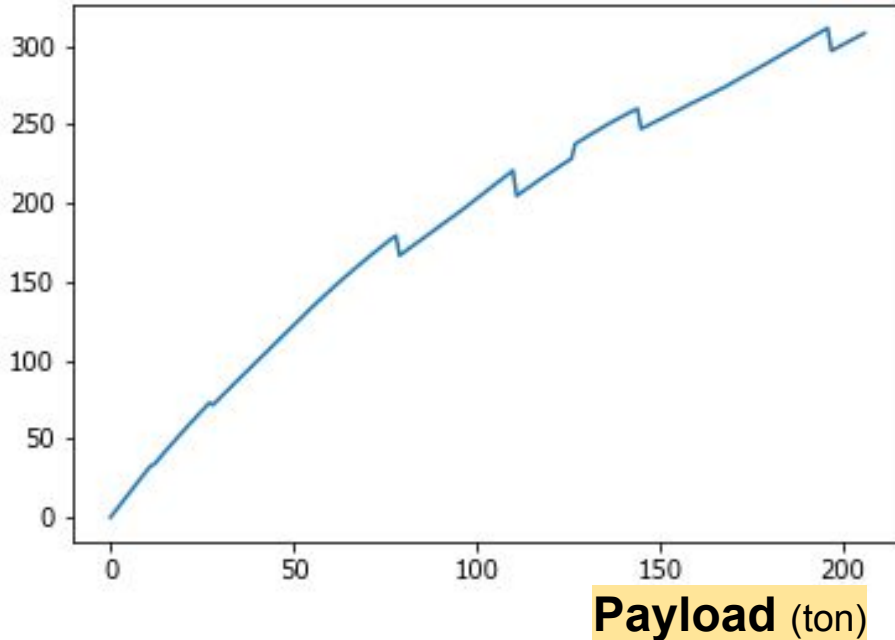- Trucks
  - 5

Estimated Weighted Productivity: 4817t/hours

Cycle time vs. Payload (Excavator 1)

Cycle Time (min)
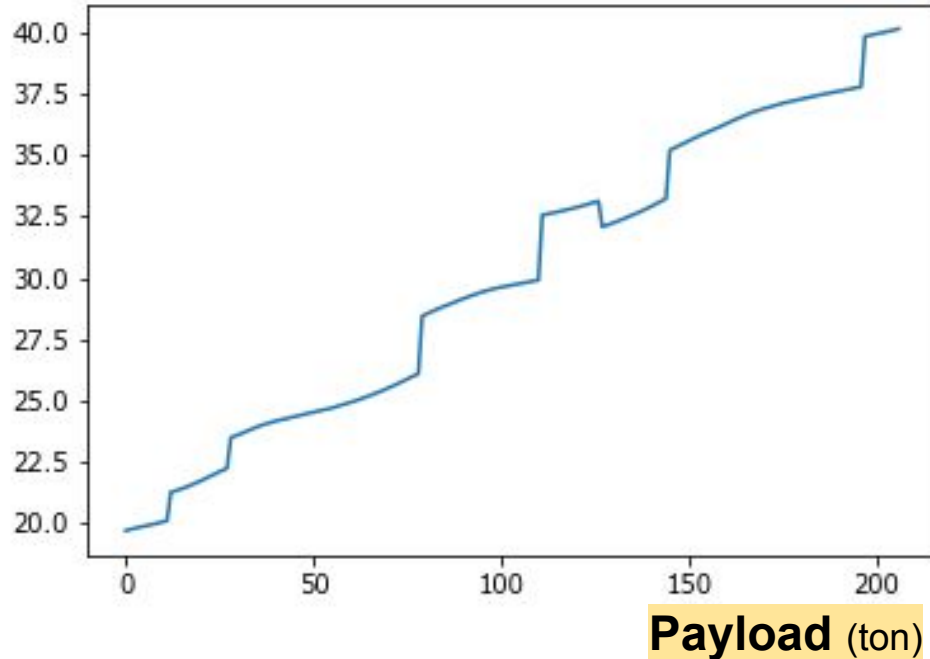
Payload (ton)

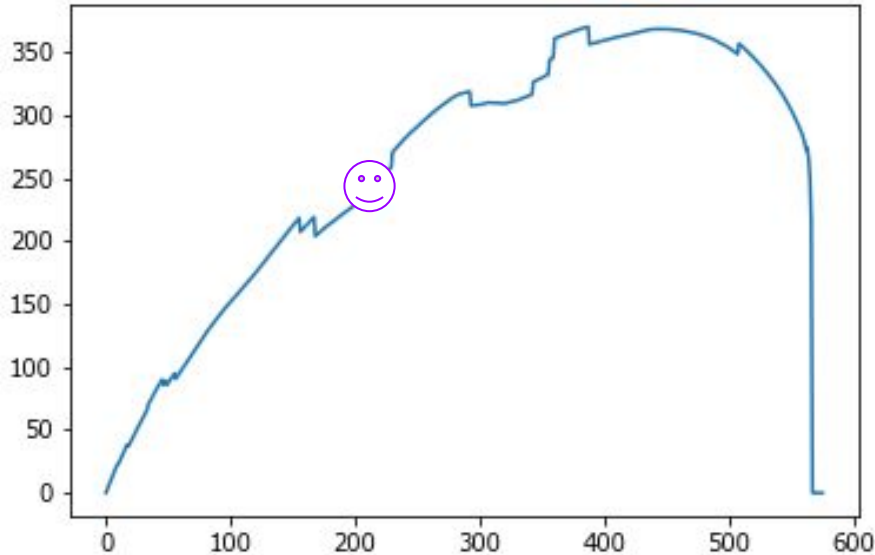# Payload vs. Productivity (Excavator 1)

Productivity (ton/hr)

Payload (ton)

Payload⬆ **Productivity**⬆

Tradeoff? (Excavator 1)
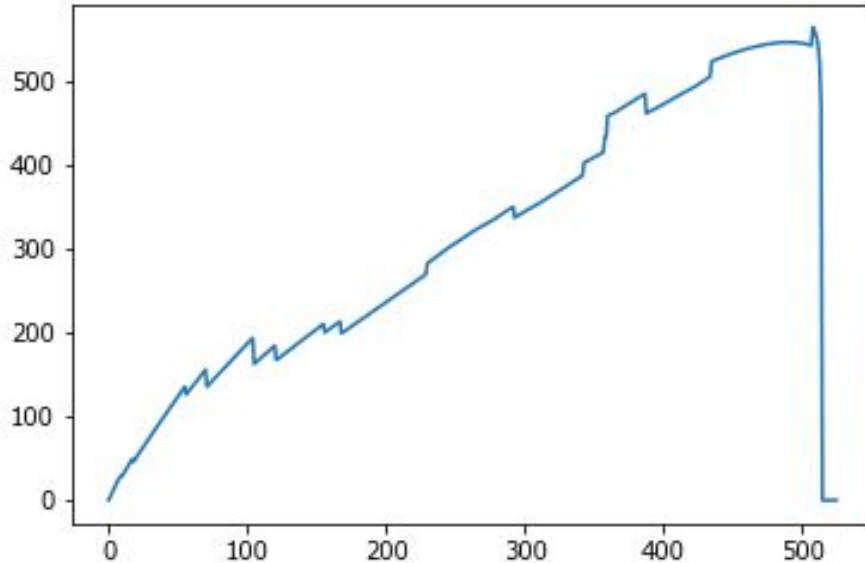
Productivity (ton/hr)

Payload (ton)

Turning point at 450

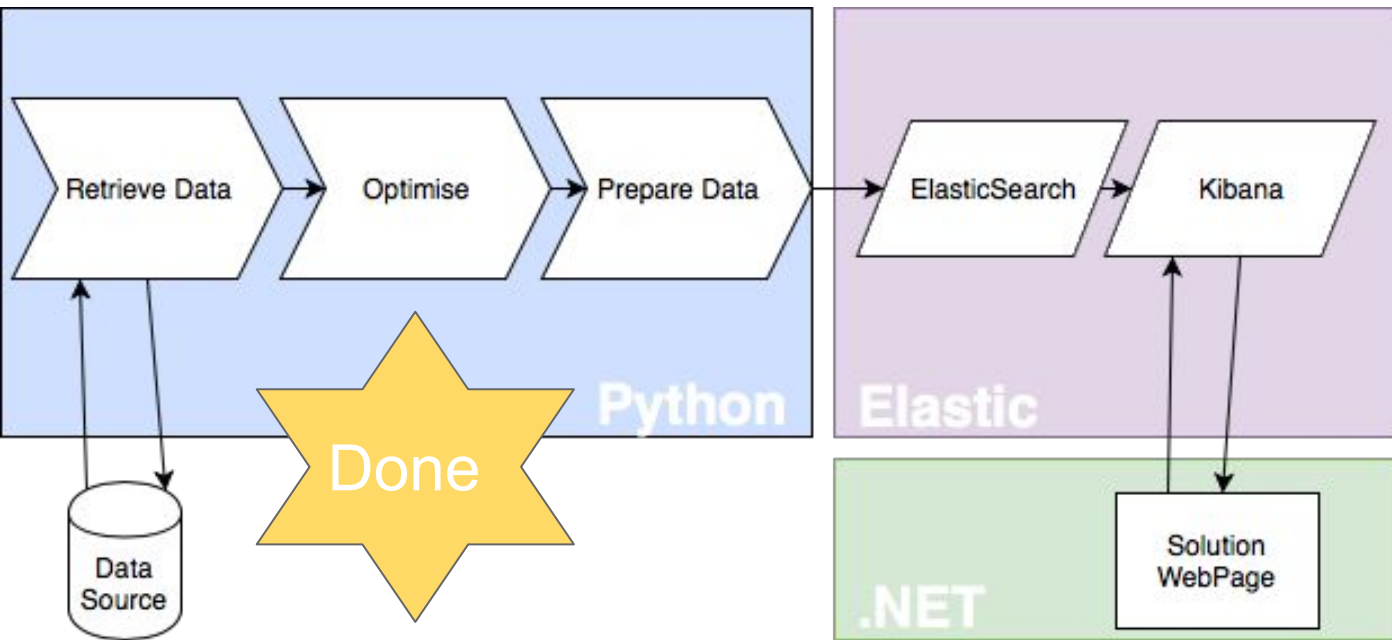# Tradeoff? (Excavator 2)

Productivity (ton/hr)

Payload (ton)

Turning point at 500

Advantages-Data Analysis

- Provide professional optimisation solution
- Accurate analysiation
- Fully automated

Product Blueprint

Q & A