



# Neo4J Graph Visualization

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Databases Final Project F2017



# What is Neo4J?

\$

```
$ CREATE (TheMatrix:Movie {title:'The Matrix', released:1999, tagline:'Welcome to the Real World'}) CREATE (Keanu:Person {name:'...
```



Graph



Rows



Code

\*(17)

Movie(8)

Person(3)

\*(18)

ACTED\_IN(8)

DIRECTED(10)



Displaying 17 nodes, 18 relationships (completed with 18 additional relationships).

AUTO-COMPLETE ☒

:play movie graph

The Movie Graph

Create

To the right is a giant code block

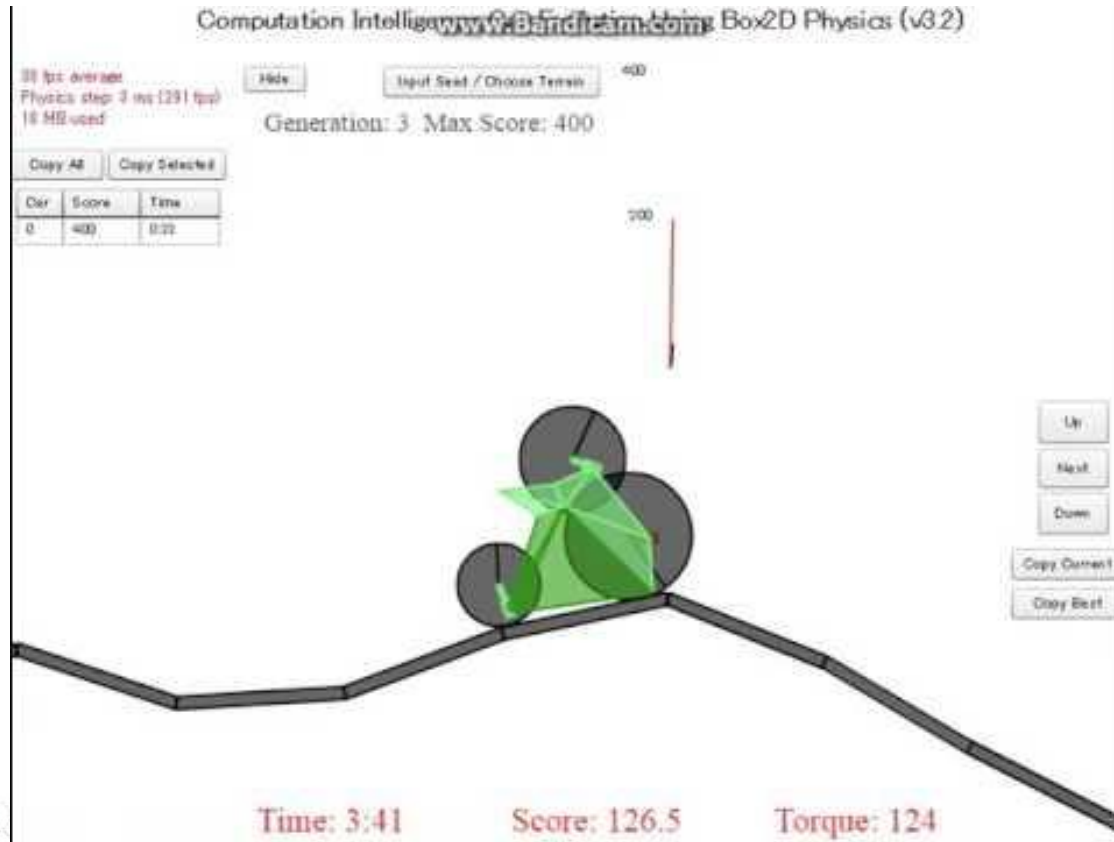
```
CREATE (TheMatrix:Movie {title:'The Matrix', released:1999, tagline:'Welcome to the Real World'})
```

A decorative network diagram in the top-left corner, featuring a complex web of interconnected nodes and lines. The nodes are represented by small circles, some of which are solid blue, while others are hollow with a blue outline. The lines connecting them are thin and grey, creating a dense, organic structure.

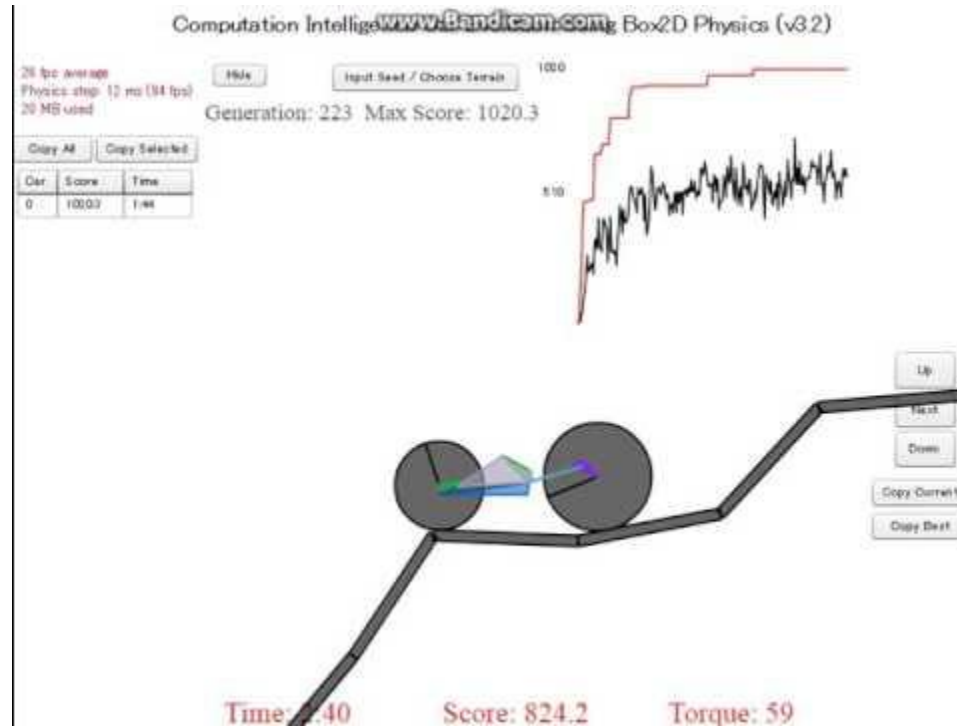
# Motivation

A decorative network diagram in the bottom-right corner, similar to the one in the top-left. It consists of a cluster of nodes connected by lines. The nodes are a mix of solid blue circles and hollow blue-outlined circles, with thin grey lines forming the connections between them.

# Evolutionary Computation (EC)

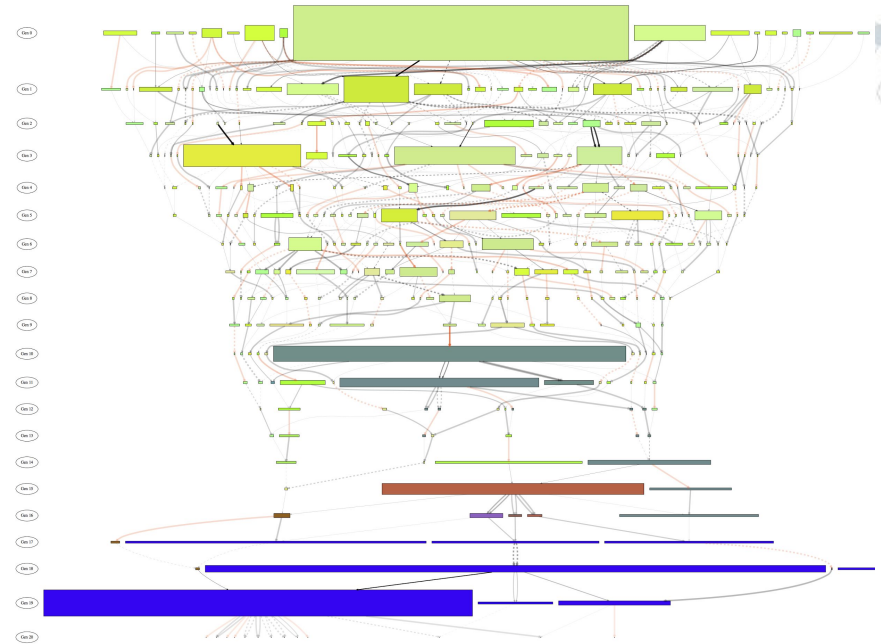


# Evolutionary Computation (EC)

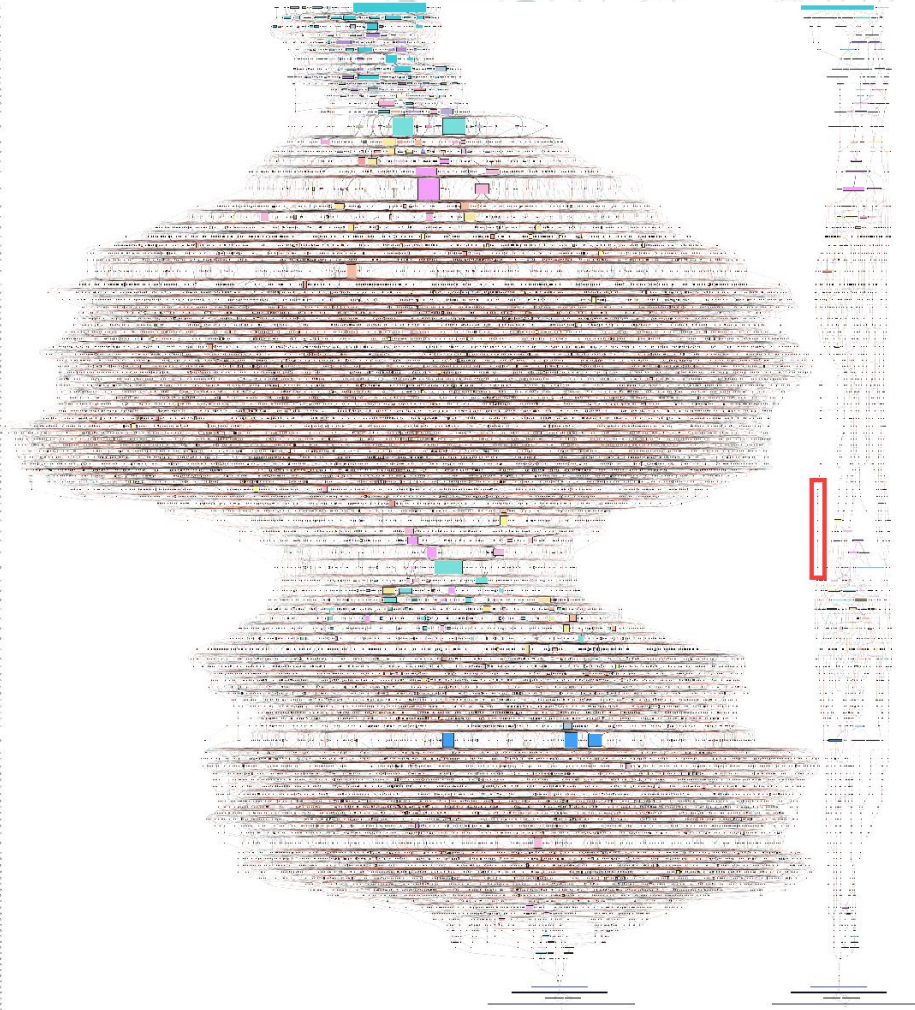
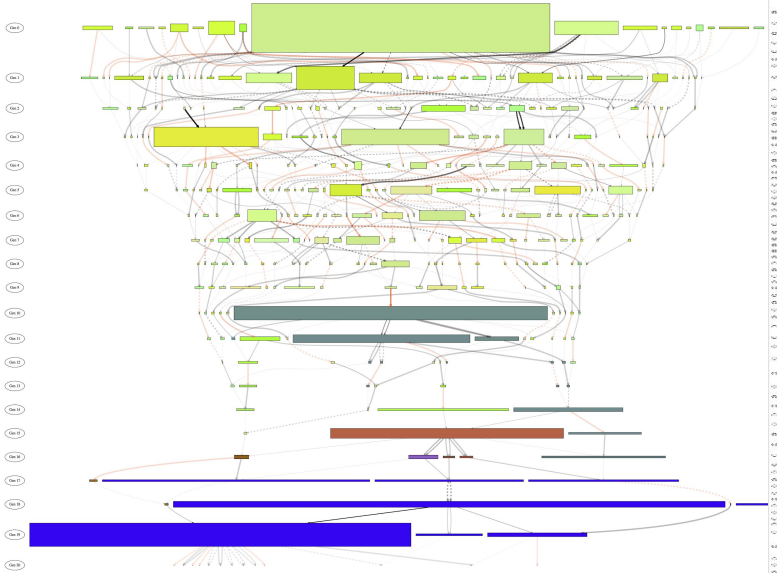


# McPhee, Specter Et.Al (Not necessarily in that order)

- Genetic Programming
- Nic McPhee adds these results into a graph database (currently neo4J)
- Nic McPhee visualizes these results in pdf's.



# PDF Graphs








## Pro's and Con's to PDF's

### Pros


- Good for a grand scale view of the run
- Because they are pdf's you can zoom into subsections of the graph

### Cons

- Slow to load, cumbersome to use
  - Too packed full of info when not filtered
  - Might miss info when filtered
- 



## This is why we want to make an interactive graphing tool

- Use in conjunction with PDF's
  - View subsections in greater detail
  - Create a good platform to share data
- 



# Graphing Tools

## Graph Tools and Libraries

- Most difficult part of the project
- Graphing Tools use a *Force Directed Graph* ([example](#))
- Tree making tools do not allow a child to have more than one parent. ([example](#))



## D3 Implementations

Two implementations we considered:

- Cinima Force-Directed Graph:
  - Neo4J's D3 Example
  - Had some documentation
- DagreD3
  - Project made by cpettitt on github
  - Tree like structure, but with graph like properties
  - dagreD3 README “ This project is not being actively developed or maintained”
- Settled on DagreD3, with Angular JS Framework, and express.js on the backend

The background of the slide is a light gray network diagram. It consists of numerous small circular nodes, some of which are solid gray and others are hollow with a gray outline. These nodes are interconnected by a web of thin, light gray lines, creating a complex, organic pattern that resembles a molecular structure or a data network. The overall aesthetic is clean and technical.

# Implementation

## API

Our project may have got REST, be we didn't.

We have two API requests

- `/getWinners`: Returns all individuals that solved the problem correctly
- `/getAncestors?child_uuid`: Returns all parents for a given individual.

## Neo4J Queries

Our project may have got REST, but we didn't.

We have two API requests

- /getWinners:

```
MATCH(n: Individual) - [HasTotalError] -> (x: TotalError {TotalError: 0 }) RETURN n LIMIT 100;
```

- /getAncestors?child\_uuid:

```
MATCH (n: Individual)-[: ParentOf]->(i: Individual {uuid: '\"'+ child_uuid +'\"'}) RETURN n;
```



The background of the image is a light gray network pattern. It consists of numerous small circles, some of which are solid gray and others are hollow with a gray outline. These circles are interconnected by a web of thin, light gray lines, creating a complex, organic structure that resembles a molecular or neural network.

# Demo

Link ([Here](#))