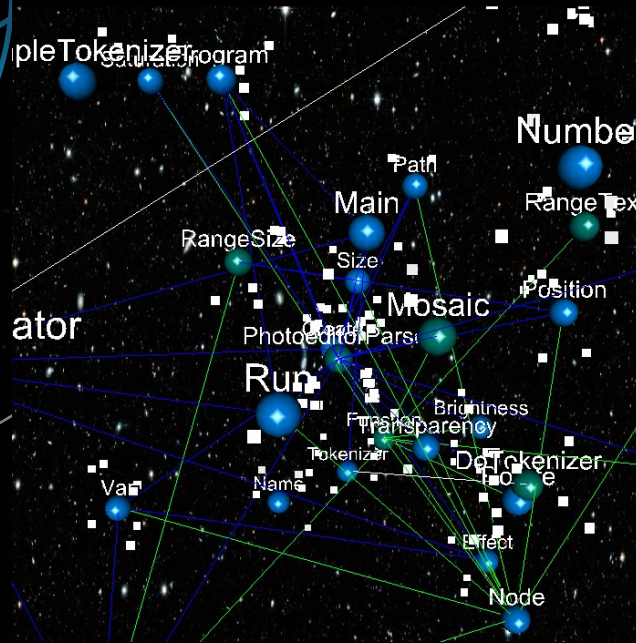
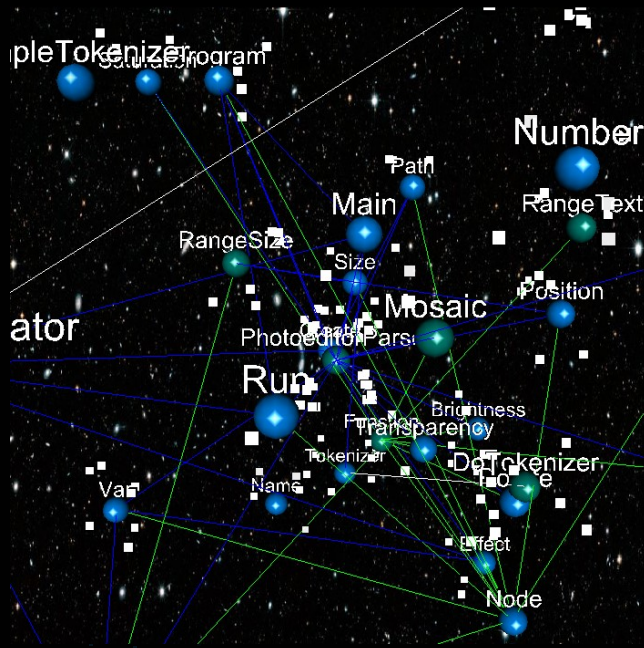


Group 16

Program Analysis + Visualization



Introduction



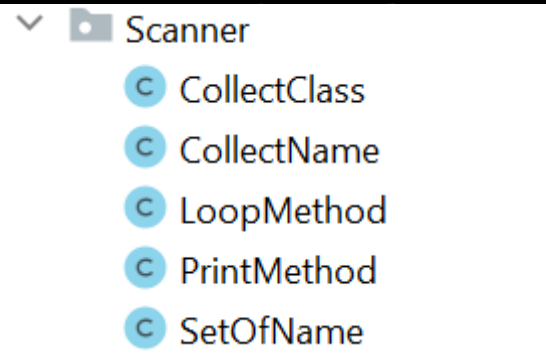
- Provide an overview of the project and changes between two commits in a simple universe
- Quickly catch the changes made by other members
- Reduce the time of debugging (tracking the dependency)



Implementation

- Static Analysis

- Collect information



- Using logic to find the classes' & method names
- Using java parse tree to get satisfied child nodes

- Java Parser & Comparing two commits

```
public Map<String, List<String>> classmethodinfo;  
public Map<String, List<String>> classexteninfo;  
public Map<String, List<String>> classsimpleinfo;  
public Map<String, List<String>> classdependinfo;  
public Map<String, Integer> classsizeinfo;  
public Map<String, List<String>> classloopinfo;  
public List<String> classinfo;;
```

- Class added/ removed
- Method added/ removed
- Inheritance added/removed
- Interface added/ removed
- Function Dependency added/ removed



Visualization

Implementation

Sphere – Class

Blue Sphere – class in 1st commit

Blue-Green Sphere – class in 2nd commit

Cube - Method

Methods in the same one class have same color

Line - Dependency

Green - extends

White - implements

Blue - function calls from other classes



User Study

3 Users with programming background and git commit experience

Pros & Cons

- **Novel Visual Experience**

Our users enjoy our universe!
Cool shining! click!

- **Correct Feedback**

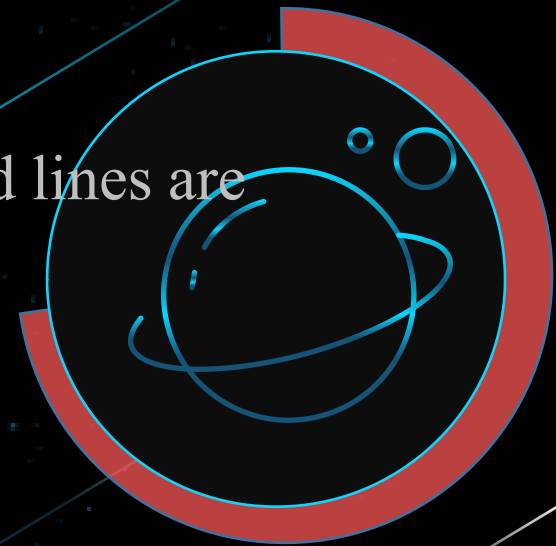
They impressed the information
analyzed and showed.

- **A Bit Crowded**

Before zoom in, some spheres and lines are
overlapping, not clear at first.

- **Have to prepare for...**

The users are required to
download their commits first and
get the path of them before using
our project.





User Study

3 Users with programming background and git commit experience

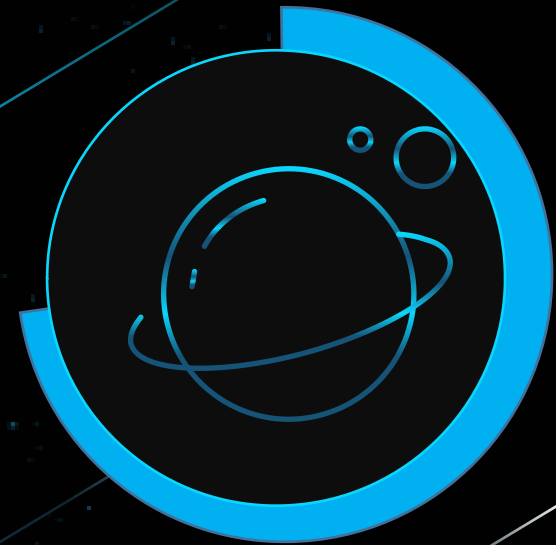
Improvement 😊

- hard to observe the changes if the object is out of scene

Add arrow keys to control the viewpoint

- what methods the rotating objects represent

Pop-up window to show the class information





To be improved

Input the local path of two commits



Directly obtain the files of any two commit on GitHub



The image features a black background with a subtle pattern of small, light blue squares. Four thin, light blue lines are positioned diagonally, one in each quadrant. In the center, there are three concentric circles of varying sizes, all in a light blue color. The text "THANK YOU" is written in a bold, white, sans-serif font, centered horizontally and partially overlaid by the circles.

THANK YOU