

ReflectoRay: Ray Reflection Simulation

Team ReflectoRay

January 11, 2024

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Introduction

- Developed by Team ReflectoRay
- Zewail City - University of Science and Technology
- Fall 2023

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Background

- Understanding ray reflection in geometric optics
- Challenges in visualization and comprehension

Challenges

- ① Lack of Interactive Tools
- ② Difficulty in Visualization
- ③ Configurability Limitations

Project Rationale

- Address challenges through ReflectoRay
- Python with Turtle graphics library
- Interactive and configurable platform

Key Features

- Interactive Visualization
- Configurability
- Visualization Enhancements
- Image and Video Output
- Progress Visualization

Advantages

- Enhanced Learning Experience
- Versatility
- Documentation and Sharing
- Real-time Feedback

Expected Outcomes

- Educational tool for geometric optics
- Hands-on and engaging learning experience
- Configurable for different scenarios
- Image and video documentation

System Requirements

- Python 3.x installed
- Required Python libraries: Turtle, OpenCV, PIL, Rich

Installation

- Install Python
- Install required libraries:

```
pip install turtle opencv-python pillow rich
```

Running the Simulation

- Clone the repository
- Navigate to the project directory
- Configure the simulation in `initial_conditions.json`
- Run the simulation: `python reflectoray.py`

Save the Simulation

- Save as image: `python reflectoray.py --image`
- Save as video: `python reflectoray.py --video`

Simulation Output

