Object Diagram

```
        ➡️ ┌──────────────┐
           │   Main/GUI   │◄─────────┐
           └──────────────┘          │
                  ↕                   │
           ┌──────────────┐          │
           │Configuration │          │
           └──────────────┘          │
                  ↓                   │
           ┌──────────────┐          │
           │  Simulation  │──────────┘
           └──────────────┘
            ↙      ↓      ↘
    ┌───────┐ ┌───────┐ ┌───────┐
    │ Event │ │ Plot  │ │ Agent │
    ├───────┤ ├───────┤ ├───────┤
    └───────┘ └───────┘ └───────┘
```
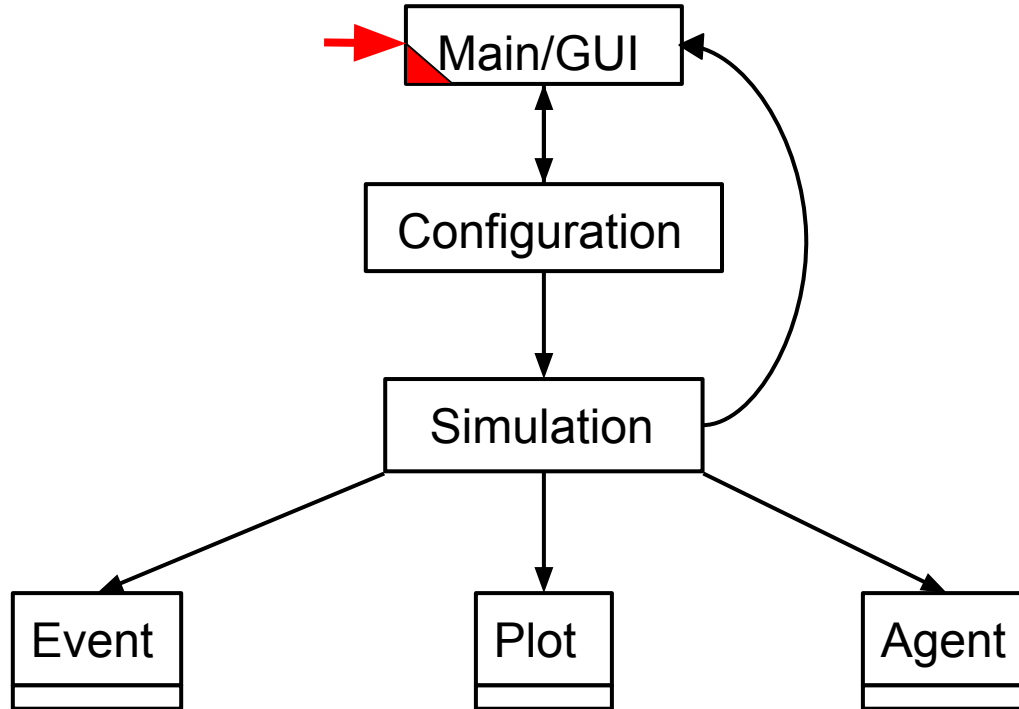
Description

GUI/Main: This encompasses the visual elements presented to the user and servers as the central hub for the program execution.

Configuration: This stores and manages user-defined settings and configuration that are essential to the operation of the program.
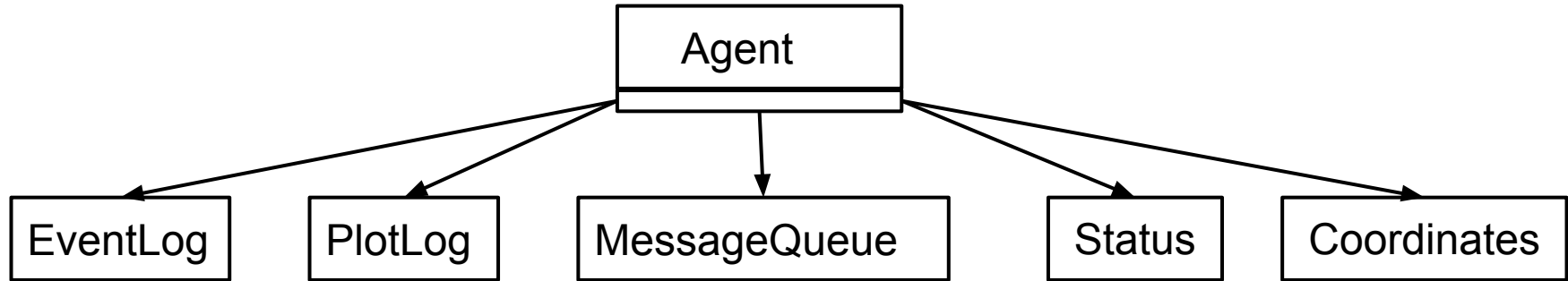
Simulation: This is responsible for orchestrating the simulation process of the disease spreading, controlling key parameters and variables.

Event: This is implemented as a separate thread, which records and communicates with the GUI and Agents to keep track of events.

Plot: This is implemented as a separate thread, which facilitates the rendering of the graphical representation of the data on a stacked graph chart.

Agent: Each agent is instantiated within the simulation and operates on its own thread. Agents can communicate with one-another depending on the distance. Messages are passed in a thread safe manner.

Agent Diagram

```
                    ┌─────────────────────┐
                    │       Agent         │
                    ├─────────────────────┤
                    └─────────────────────┘
         ┌──────────┬──────────┼──────────┬──────────┐
         ▼          ▼          ▼          ▼          ▼
   ┌──────────┐ ┌────────┐ ┌──────────────┐ ┌────────┐ ┌─────────────┐
   │ EventLog │ │PlotLog │ │ MessageQueue │ │ Status │ │ Coordinates │
   └──────────┘ └────────┘ └──────────────┘ └────────┘ └─────────────┘
```

Each agent autonomously manages its state variables which include status, coordinates, and event history. Each agent possess the capability to transmit important information to the central EventLog and PlotLog where it will be presented to the user visually. LinkedBlockingQueue's were utilized for thread-safe communication. Each que is emptied before moving onto the next que.

Package Diagram

conf
Configuration

gui

Main/GUI	Agent	Simulation

log

Event	Plot