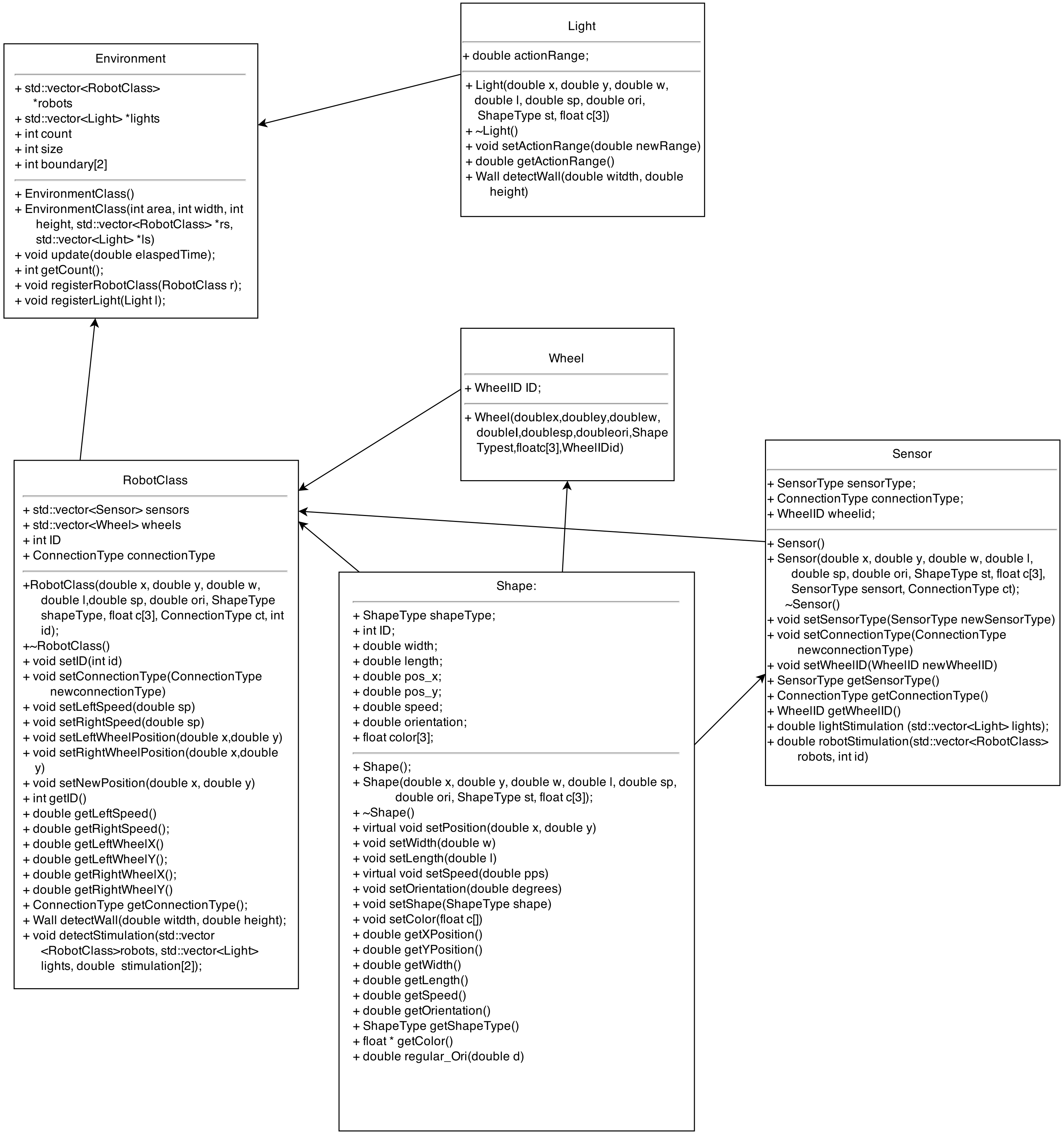

```
Light
+ double actionRange;
+ Light(double x, double y, double w,
  double l, double sp, double ori,
   ShapeType st, float c[3])
+ ~Light()
+ void setActionRange(double newRange)
+ double getActionRange()
+ Wall detectWall(double witdth, double
      height)
```

```
Environment
+ std::vector<RobotClass>
    *robots
+ std::vector<Light> *lights
+ int count
+ int size
+ int boundary[2]
+ EnvironmentClass()
+ EnvironmentClass(int area, int width, int
     height, std::vector<RobotClass> *rs,
     std::vector<Light> *ls)
+ void update(double elaspedTime);
+ int getCount();
+ void registerRobotClass(RobotClass r);
+ void registerLight(Light l);
```

```
Wheel
+ WheelID ID;
+ Wheel(doublex,doubley,doublew,
   doublel,doublesp,doubleori,Shape
   Typest,floatc[3],WheelIDid)
```

```
Sensor
+ SensorType sensorType;
+ ConnectionType connectionType;
+ WheelID wheelid;
+ Sensor()
+ Sensor(double x, double y, double w, double l,
      double sp, double ori, ShapeType st, float c[3],
      SensorType sensort, ConnectionType ct);
    ~Sensor()
+ void setSensorType(SensorType newSensorType)
+ void setConnectionType(ConnectionType
        newconnectionType)
+ void setWheelID(WheelID newWheelID)
+ SensorType getSensorType()
+ ConnectionType getConnectionType()
+ WheelID getWheelID()
+ double lightStimulation (std::vector<Light> lights);
+ double robotStimulation(std::vector<RobotClass>
        robots, int id)
```

```
RobotClass
+ std::vector<Sensor> sensors
+ std::vector<Wheel> wheels
+ int ID
+ ConnectionType connectionType
+RobotClass(double x, double y, double w,
    double l,double sp, double ori, ShapeType
    shapeType, float c[3], ConnectionType ct, int
    id);
+~RobotClass()
+ void setID(int id)
+ void setConnectionType(ConnectionType
      newconnectionType)
+ void setLeftSpeed(double sp)
+ void setRightSpeed(double sp)
+ void setLeftWheelPosition(double x,double y)
+ void setRightWheelPosition(double x,double
  y)
+ void setNewPosition(double x, double y)
+ int getID()
+ double getLeftSpeed()
+ double getRightSpeed();
+ double getLeftWheelX()
+ double getLeftWheelY();
+ double getRightWheelX();
+ double getRightWheelY()
+ ConnectionType getConnectionType();
+ Wall detectWall(double witdth, double height);
+ void detectStimulation(std::vector
    <RobotClass>robots, std::vector<Light>
    lights, double  stimulation[2]);
```

```
Shape:
+ ShapeType shapeType;
+ int ID;
+ double width;
+ double length;
+ double pos_x;
+ double pos_y;
+ double speed;
+ double orientation;
+ float color[3];
+ Shape();
+ Shape(double x, double y, double w, double l, double sp,
          double ori, ShapeType st, float c[3]);
+ ~Shape()
+ virtual void setPosition(double x, double y)
+ void setWidth(double w)
+ void setLength(double l)
+ virtual void setSpeed(double pps)
+ void setOrientation(double degrees)
+ void setShape(ShapeType shape)
+ void setColor(float c[])
+ double getXPosition()
+ double getYPosition()
+ double getWidth()
+ double getLength()
+ double getSpeed()
+ double getOrientation()
+ ShapeType getShapeType()
+ float * getColor()
+ double regular_Ori(double d)
```