CIPHER ROGUE

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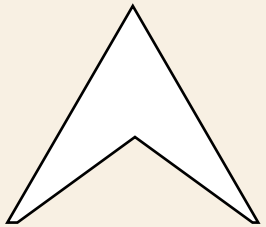
ENTITÉS DU JEU

Player

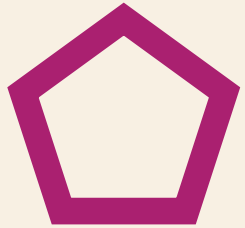


Shooter
Sniper

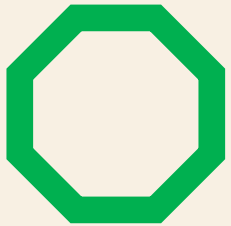
Bomber

Seeker

Charger



Turret



Spawner

Bullet
Bombshell

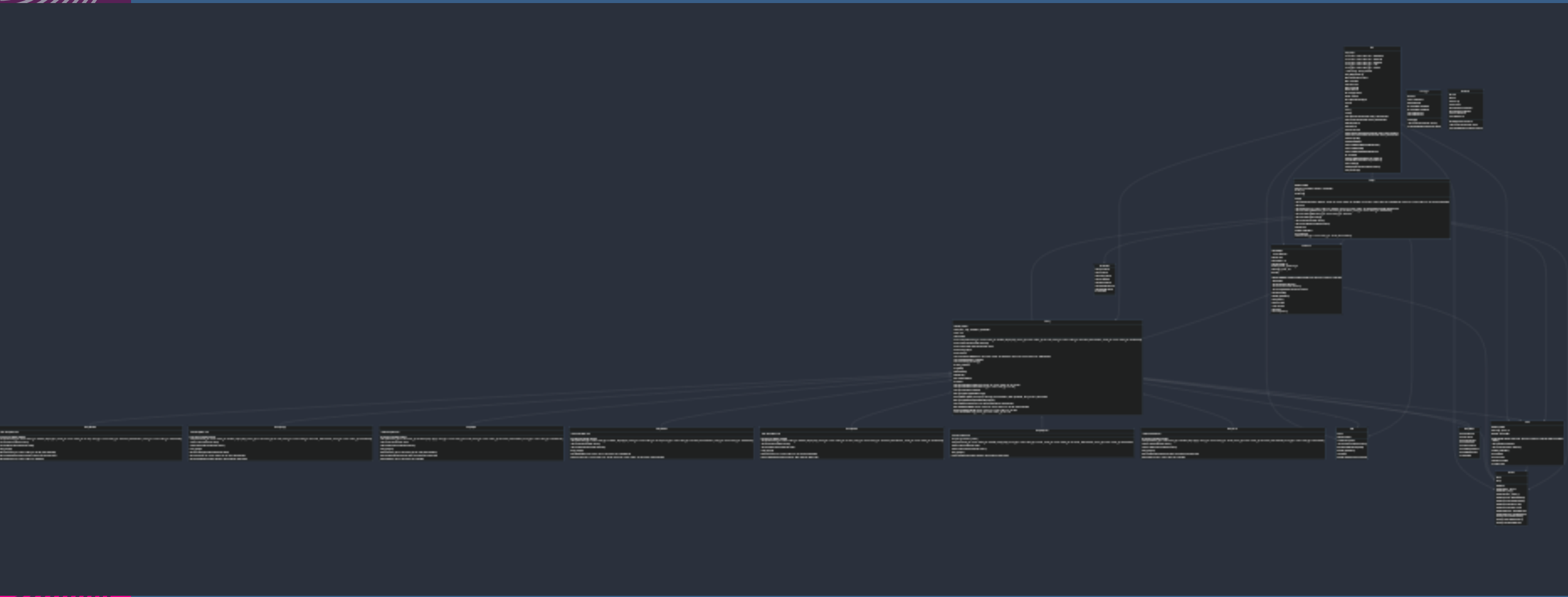
Bullet

Bombshell

Bullet

Seeker

DIAGRAMME DES CLASSES



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ENEMY

```
void Enemy::smoothTurn(float targetAngle, float turnSpeedFactor, float deltaTime){
    float angleDiff = targetAngle - angle;

    // angleDiff stays between PI and -PI
    if (angleDiff > M_PI) {
        angleDiff -= 2 * M_PI;
    } else if (angleDiff < -M_PI) {
        angleDiff += 2 * M_PI;
    }

    angle += angleDiff * turnSpeedFactor * deltaTime * 60;

    // angle stays between PI and -PI
    if (angle > M_PI) {
        angle -= 2 * M_PI;
    } else if (angle < -M_PI) {
        angle += 2 * M_PI;
    }
}
```

ENEMY

```
void Enemy::adjustPositionBasedOnEnemies(std::shared_ptr<std::vector<std::unique_ptr<Enemy>>>& enemies){
    float angleEnemyEnemy, hitBoxBoth, moveDistance;
    Position enemyPos, diffPos;
    for (const auto & enemy : *enemies) {
        if (enemy.get() == this) continue; //We skip if it's the enemy itself

        enemyPos = enemy->getPosition();
        hitBoxBoth = static_cast<float>(enemy->getSize() + size);
        diffPos = position - enemyPos;
        // sqrt(x² + y²) < distance <=> x² + y² < distance²
        if (diffPos.x * diffPos.x + diffPos.y * diffPos.y < hitBoxBoth * hitBoxBoth){
            angleEnemyEnemy = std::atan2(enemyPos.y - position.y, position.x - enemyPos.x);
            moveDistance = hitBoxBoth - std::sqrt(diffPos.x * diffPos.x + diffPos.y * diffPos.y);

            if(enemy->isMovable()){
                enemy->setPosition(enemyPos + Position(std::cos(M_PI+angleEnemyEnemy) * moveDistance / 4,
                                                       - std::sin(M_PI + angleEnemyEnemy) * moveDistance / 4));

                position += Position(std::cos(angleEnemyEnemy) * moveDistance / 4,
                                     - std::sin(angleEnemyEnemy) * moveDistance / 4);
            }
            else{
                position += Position(std::cos(angleEnemyEnemy) * moveDistance / 2,
                                     - std::sin(angleEnemyEnemy) * moveDistance / 2);
            }
        }
    }
}
```

PLAYER

```cpp
void Player::move(float deltaTime) {
    int xAxisMove, yAxisMove = 0;
    if(sf::Keyboard::isKeyPressed(sf::Keyboard::Up)) { yAxisMove++; }
    if(sf::Keyboard::isKeyPressed(sf::Keyboard::Left)) { xAxisMove--; }
    if(sf::Keyboard::isKeyPressed(sf::Keyboard::Down)) { yAxisMove--; }
    if(sf::Keyboard::isKeyPressed(sf::Keyboard::Right)) { xAxisMove++; }

    if (yAxisMove != 0 && xAxisMove != 0) {
        position += Position(xAxisMove * std::sqrt(2)/2,-yAxisMove * sqrt(2)/2) * speed * deltaTime * 60;
    } else {
        position += Position(xAxisMove,-yAxisMove) * speed * deltaTime * 60;
    }
}
```

PLAYER & ENEMY

```
for (const auto & wall : *walls) {
    Position wallPos = wall->getPosition();
    float angleWallPlayer = std::atan2(wallPos.y - position.y, position.x - wallPos.x);

    if(wall->isInWall(position + Position(-std::cos(angleWallPlayer),std::sin(angleWallPlayer))*size)){

        if (-M_PI/4 <= angleWallPlayer && angleWallPlayer <= M_PI/4) {
            position.x = wall->getPoint(1).x;
        } else if (angleWallPlayer >= M_PI*3/4 || angleWallPlayer <= -M_PI*3/4) {
            position.x = wall->getPoint(0).x;
        } else if (M_PI/4 <= angleWallPlayer && angleWallPlayer <= M_PI*3/4) {
            position.y = wall->getPoint(1).y;
        } else {
            position.y = wall->getPoint(2).y
        }

    }
}
```

GAME

```cpp
int Game::selectMap() {
    std::vector<double> weights;

    for (int i = 0; i < 10; i++) {
        double weight = level - mapSelectionHistory[i];
        weights.push_back(weight);
    }

    std::random_device rd;
    std::mt19937 gen(rd());
    std::discrete_distribution<> dist(weights.begin(), weights.end());

    int selectedIndex = dist(gen);
    mapSelectionHistory[selectedIndex] += 1;
    return selectedIndex;
}
```

GAME

```
void Game::update(sf::RenderWindow &window, float deltaTime) {
    //...
    if (enemies->size() == 1) {
        for (unsigned int i = 0; i < bulletsAlly->size(); i++) {
            if (isClose(*bulletsAlly->at(i), *enemies->at(0))
                && bulletsAlly->at(i)->getDamage() >= enemies->at(0)->getHp()) {
                    deltaTime /= 5;
                    break;
            }
        }
    }
    //...
}
```

CONCLUSION

Défis :

- Collisions entre les ennemis et avec les murs
- Gestion de la mémoire

Amélioration :

- Plus de type d'ennemis
- Plus de type de projectiles
- Plus d'obstacles
- Des améliorations entre chaque niveau
- Des boss
- Effets visuels
- Meilleure gestion des déplacements