

Integration of Database Management Systems and Video Game Engines for Optimal and Sub-Optimal Pathfinding

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1 Introduction

The use of databases to improve the efficiency of pathfinding in video games offers a way to reduce the cost of pathfinding, freeing resources for the other components of a video game. Additionally, database management systems offer pre-existing solutions to problems like ‘dupping,’ encountered by large multiplayer games.

2 Integration

The performance of SQL implementations of A* and Weighted A* (WA*), as well as implementations of A* and WA* in pgRouting, an extension for PostgreSQL, will be compared on one or more sets of 2D pathfinding problems within OpenRA. WA* implementations will be produced by modifying O’Grady’s and pgRouting’s existing implementations of A*.

3 Analysis

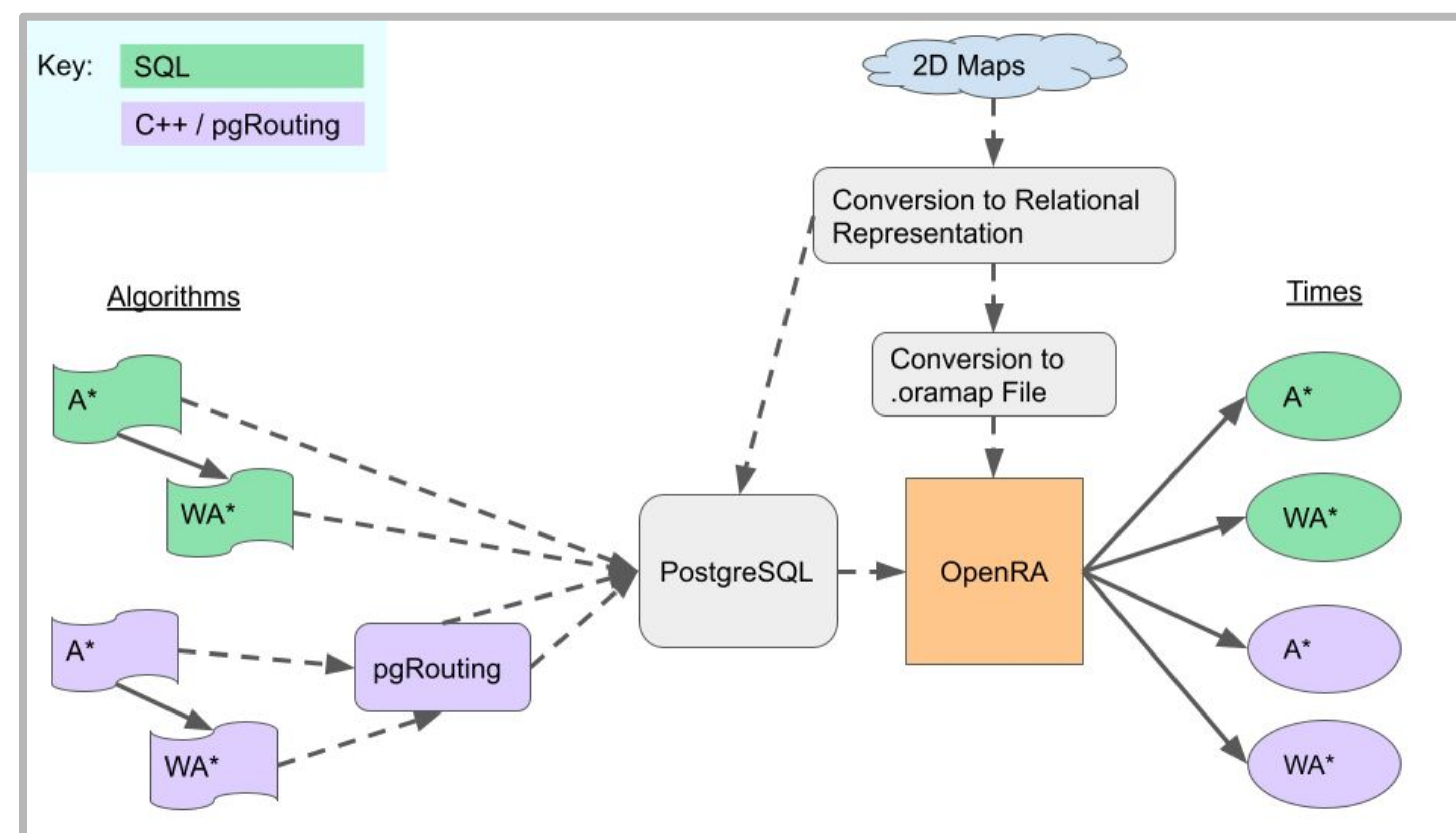
The performance of A* and Weighted A* (WA*), and pgRouting’s implementations of A* and WA*, will be compared on several sets of 2D pathfinding problems within OpenRA. Multiple weights will be used for WA*.

O’Grady’s Dissertation

Much of this project is based on O’Grady’s 2021 dissertation, “Bringing Database Management Systems and Video Game Engines Together,” which has a section relating to pathfinding that includes an implementation of A* in SQL.

OpenRA and Strategy

OpenRA, used in both this project and O’Grady’s work, is an open-source game engine which focuses on real-time strategy (RTS) games. For that reason, this project will also focus on the RTS genre. Maps used for experiments will be drawn from Warcraft III and StarCraft, both commercial RTS games.



Results

To Be Determined

Map Representation

Maps from Warcraft III and StarCraft will be converted to a relational format useable for pathfinding within PostgreSQL, and then to a .oramap format so they can be used within OpenRA.

Implications

To Be Determined