VRP++ - A software library for data structures supporting the fast and simple implementation of routing algorithms

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Abstract

In theory, VRP researchers are perfectly prepared to implement algorithms. They can produce self-explaining code that can be easily re-used. Their implementation job is well limited and focusses on the implementation of innovative algorithm issues only. Finally, they are able to realize a new implementation quickly so that new algorithmic ideas can be assessed immediately. Obviously, the observation of the reality reveals different issues: most generated code is readable only by its originator(s) and can hardly be reused. A lot of overhead" implementation effort is needed until an algorithm runs: data structures needed to be defined and the preparation of features for data reading and results printing is needed. Finally, the effort to implement new algorithm ideas is often quite comprehensive since inflexible data structures have to be adjusted but the corresponding code is quite dispersed. The selection of an inappropriate coding language like MATLAB, Visual Basic or other scripting languages results in inefficient algorithm performance. Overall, implementation is quite time consuming and requires excellent programming skills that are often not available. VRP++ is a collection of C++ data structures and software classes. It enables students with small programming skills/experience to quickly code VRP-algorithms in C++. It prevents a lot of the unnecessary overhead implementation and offers functions to setup, manipulate or delete vehicle route sets. By means of some simple examples, we demonstrate the ease of using the VRP++ code to set up structured and understandable C++- code for algorithms to solve different types of vehicle routing problem scenarios.

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