ANNUAL WORKSHOP
of the EURO working group on Vehicle Routing
and Logistics optimization

6-8 June 2016

CONFERENCE PROGRAM AND PRACTICAL INFORMATION
Annual workshop of the EURO working group on Vehicle Routing and Logistics optimization (VeRoLog)

Program

Nantes (France) – June 6-8, 2016
Dear VeRoLog 2016 participant,

We are very happy to welcome you in Nantes for the fifth meeting of the EURO Working Group on Vehicle Routing and Logistics optimization (VeRoLog 2016). The VeRoLog conference is an annual meeting bringing together the large community of researchers and practitioners interested in vehicle routing optimization and its relationship with logistics. The conference is open to high quality methodological contributions, relevant real-world applications, and case studies from industry and the service sector.

The program for this 5th edition is made up of 142 presentations covering a broad range of topics related to routing (e.g., dynamic vehicle routing, routing with synchronization, technician routing) and logistics (e.g. facility location, network design, supply chain management). A landmark for this edition is the notable body of research involving environmental issues (e.g. bike and vehicle sharing, electric vehicle routing, green vehicle routing and logistics). All these presentations are scheduled in five or six parallel sessions. We also have the pleasure to welcome 2 invited speakers: Stefan Røpke (Technical University of Denmark), whose talk is entitled « 10 years of Adaptive Large Neighborhood Search (ALNS) », and Mike Hewitt (Loyola University Chicago) who will present « recent advances in service network design ». As the perfect complement to the technical sessions and plenary talks, the program also includes 4 special slots devoted to more industry-oriented talks: two tutorials by LocalSolver and PTV Group and two brainstorming sessions by ORTEC and and GTS Systems. In the latter, a novelty in VeRoLog conferences, the companies will share a problem with the community and brainstorm with the participants on ways to solve it.

In addition to the scientific program, we offer a series of social events. A « Wine and cheese » evening will take place at A Cantina on the l’île Feydeau on Tuesday June 6. The gala dinner is programmed on June 7 at the restaurant L’Assise, Radisson Blu Hotel. The social program also includes a farewell event downtown Nantes on the evening of Wednesday June 8. While going from one event to the other, you will have the chance to walk through the historical centre of the city, and to discover the castle, the cathedral, the Passage Pommeraye, ...

We thank all the academic and regional sponsors of VeRoLog 2016 for their generous support: Ecole des Mines de Nantes, Université d’Angers, Université de Bretagne-Sud, Polytech’Tours, IRCCyN, LARIS, Lab-STIC, L, Nantes Métropole, Région Pays de Loire, as well as the scientific societies EURO and ROADEF. Further, we are very grateful to the companies GTS Systems & Consulting, LocalSolver, ORTEC and PTV Group for their support which attest of the interest of this conference for industry. Special thanks go also to Daniele Vigo and the VeRoLog board for their advice and guidance. Finally, we would like to extend our sincere thanks to the many people that have contributed to VeRoLog 2016.

We wish you all a pleasant conference with fruitful intellectual exchange, and a delightful stay in Nantes.

Christelle, Fabien, Jorge, Olivier, and Marc
Committees

Organizing committee
Fabien Lehuédé – General Chair
Marc Sevaux – Program Chair
Christelle Guéret – Sponsoring and funding
Jorge E. Mendoza – Webmaster
Olivier Péton – Social Program

Administrative support
Cyrille Allais
Isabelle Lainé
Mireille Méchineau

Local committee
Kevin Barreau
Naima Belakbir
Yuan Bian
Aurélien Froger
Philippe Grangier
Axel Grimault
Alex Kosgovagan
Marion Le Garrec
Ka Yu Lee
Juliette Medina
Alejandro Montoya
Panagiotis Pylarinos
Oscar Tellez Sanchez
Quentin Tonneau
Rui Xia
Xiao Yang
Yulong Zhao

Advisory committee
Daniele Vigo
Marielle Christiansen
Angel Corberan
Wout Dullaert
Richard Eglese
Geir Hasle
Stefan Irnich
Frederic Semet
Maria Grazia Speranza
THE VENUE

VeRoLog 2016 will be hosted at the Mines Nantes engineering school in the north of Nantes (9km away from the city center). More precisely, the campus is located at 4 Rue Alfred Kastler, 44300 Nantes (France).

The two following figures depict the conference venue.
Level 1

Room 5 - Galois
Room 4 - Teillac

Corridor to rooms 4 - Teillac and 5 - Galois

Room Carnot
Room 3 - Pascal
Room 2 - Besse

Meeting room A125

Room 1 - Kastler
Plenary talks, tutorials and brainstorming sessions

Room 7 - Charpak
Tutorials and brainstorming sessions
## BUS SCHEDULES

### From downtown to Mines-Nantes

<table>
<thead>
<tr>
<th>C6</th>
<th>JOUR ROSE (Lundi à Vendredi)</th>
<th>Hermeland → Chanterie - Grandes Écoles</th>
<th>8 MIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:00</td>
<td>5:20</td>
<td>5:40</td>
<td>6:20</td>
</tr>
<tr>
<td>5:04</td>
<td>5:24</td>
<td>5:44</td>
<td>6:24</td>
</tr>
<tr>
<td>5:05</td>
<td>5:25</td>
<td>5:45</td>
<td>6:25</td>
</tr>
<tr>
<td>5:12</td>
<td>5:32</td>
<td>5:52</td>
<td>6:32</td>
</tr>
<tr>
<td>5:14</td>
<td>5:34</td>
<td>5:54</td>
<td>6:34</td>
</tr>
<tr>
<td>5:16</td>
<td>5:36</td>
<td>5:56</td>
<td>6:36</td>
</tr>
<tr>
<td>5:20</td>
<td>5:40</td>
<td>6:20</td>
<td>7:00</td>
</tr>
<tr>
<td>5:30</td>
<td>5:50</td>
<td>6:30</td>
<td>7:10</td>
</tr>
<tr>
<td>6:54</td>
<td>7:14</td>
<td>7:54</td>
<td>8:34</td>
</tr>
<tr>
<td>7:50</td>
<td>8:10</td>
<td>8:50</td>
<td>9:30</td>
</tr>
</tbody>
</table>

### From Mines-Nantes to Downtown

<table>
<thead>
<tr>
<th>C6</th>
<th>JOUR ROSE (Lundi à Vendredi)</th>
<th>Chanterie - Grandes Écoles → Hermeland</th>
<th>8 MIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>8:20</td>
<td>8:40</td>
<td>9:20</td>
</tr>
<tr>
<td>8:14</td>
<td>8:34</td>
<td>8:54</td>
<td>9:34</td>
</tr>
<tr>
<td>8:20</td>
<td>8:40</td>
<td>9:20</td>
<td>10:00</td>
</tr>
<tr>
<td>8:30</td>
<td>8:50</td>
<td>9:30</td>
<td>10:10</td>
</tr>
</tbody>
</table>

### Notes
- The schedule runs from Monday to Friday.
- The times are approximate and subject to change.
- Please check the latest schedules for the most accurate times.
Main bus stops in the city center (line C6 is the fastest way to get to Mines Nantes)
SOCIAL PROGRAM

Sunday 5
Informal get together
Starting 6:00pm – Le lieu unique (2 Quai Ferdinand Favre)

Monday 6
Wine & Cheese
7:00pm - A Cantina (28 Rue Kervégan)

Tuesday 7
Gala Dinner
7:30pm - Restaurant l’Assise
Radison Blu hotel (6 Place Aristide Briand)
<table>
<thead>
<tr>
<th>Time</th>
<th>Mon. 06</th>
<th>Tue. 07</th>
<th>Wed. 08</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00</td>
<td>Registration (Forum)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 09:00 | Welcome session (Kastler) | Plenary session | WA1: Bike and vehicle sharing (Kastler)  
WA2: Collaborative transp. and logistics (Besse)  
WA3: Routing with synchronization (Pascal)  
WA4: Shortest path problems (Teillac)  
WA5: Technician routing (Galois)  
WA6: Green vehicle routing and logistics (A002) |
| 10:00 | | Coffee break (Forum) | |
| 11:00 | MA1: Real road networks (Kastler)  
MA2: Railway applications and others (Besse)  
MA3: Freight transportation (Pascal)  
MA4: Inventory routing (Teillac)  
MA5: Waste management (Galois)  
MA6: Heuristics (A002) | TA1: Exact methods (Kastler)  
TA2: Vehicle routing with time windows (Besse)  
TA3: City Logistics (Pascal)  
TA4: Inventory routing (Teillac)  
TA5: Pickup and delivery (Galois) | WB1: Freight transportation (Kastler)  
WB2: Multi-objective VRPs (Besse)  
WB3: Ports and logistics (Pascal)  
WB4: Inventory routing (Teillac)  
WB5: Rich VRP (Galois)  
WB6: Meta-heuristics (A002) |
| 12:00 | Lunch | Lunch | Lunch |
| 13:00 | | | |
| 14:00 | Tutorial: Solving routing and scheduling problems using LocalSolver (Kastler)  
Brainstorming: When is a route really feasible in practice? (Charpak) | Tutorial: PTV xServer (Charpak)  
Brainstorming: The VRP with rhythms (Kastler) | |
| 15:00 | MB1: Stochastic vehicle routing (Kastler)  
MB2: Maritime transportation (Besse)  
MB3: Bike and vehicle sharing (Pascal)  
MB4: City Logistics (Teillac)  
MB5: Split deliveries (Galois) | TB1: Dial-a-Ride (Kastler)  
TB2: Healthcare logistics (Besse)  
TB3: TSP variants (Pascal)  
TB4: Green vehicle routing and logistics (Teillac)  
TB5: Facility Location (Galois) | |
| 16:00 | Coffee break (Forum) | Coffee break (Forum) | |
| 17:00 | MC1: Rich VRP (Kastler)  
MC2: City Logistics (Besse)  
MC3: Supply chain management (Pascal)  
MC4: Inventory routing (Teillac)  
MC5: Facility Location (Galois) | TC1: Rich VRP (Kastler)  
TC2: Dynamic vehicle routing (Besse)  
TC3: Maritime transportation (Pascal)  
TC4: Column generation/branch&price (Teillac)  
TC5: Facility Location (Galois) | VeRoLog Closing session (Kastler) |
It is a decade ago since the first paper describing the Adaptive Large Neighborhood Search (ALNS) was published. Since then the heuristic has been applied to a multitude of vehicle routing problems and it has often been shown to produce competitive results. A potential reason for the popularity of the heuristic is that it is easy to incorporate new constraints and/or changes to the objective function and that it requires relatively little tuning in order for the heuristic to produce satisfactory results. These properties make the heuristic especially well-suited for handling real-life problems.

The ALNS is based on the metaheuristics Large Neighborhood Search and Ruin-and-Recreate. These heuristics move from solution to solution by repeatedly destroying part of the solution and afterwards repairing the solution again. The Adaptive Large Neighborhood Search (ALNS) heuristic extends the aforementioned heuristics by utilizing a portfolio of algorithms for both destroying and repairing a solution. The heuristic keeps track of the impact of the destroy/repair methods and favor methods that has been successful in the previous iterations. The reasoning behind this is to let the heuristic adapt to the instance at hand and to the current state of the search.

The talk will review the basic ideas behind the heuristic as well as the origins of it. We will look at the development that has taken place since the first papers describing the heuristic, including applications of the heuristic. From this we will derive information about the most important components of the heuristic and provide rules of thumb for key decisions encountered when implementing the heuristic for a new problem. Finally, we will attempt to outline potential future research topics related to the adaptive large neighborhood search heuristic.
Consolidation carriers transport customer shipments that are small relative to container capacity and have enabled, amongst other things, the transformative effects of eCommerce. They typically participate in one of two industries: (1) less-than-truckload (LTL) freight, a roughly $30 billion industry in the United States, and, (2) small package/parcel, a much larger industry with one player alone (UPS) reporting $54 billion in revenue in 2012. Both LTL and small package carriers play a prominent role in the fulfillment of orders placed online, in brick-and-mortar stores, and through other channels. Fast shipping times and low costs are critical to the success of retailers that compete in a global marketplace; a survey by Pitney-Bowes reported that 49% of shoppers abandoned a purchase due to shipping costs. For a consolidation carrier to deliver goods in a cost-effective manner they must consolidate shipments, which in turn requires planning paths for different shipments that coordinate in both space and time. The processes that plan these paths have long been assisted by solving the Service Network Design problem, which prescribes the choice of paths for shipments and the services or resources necessary to execute them.

Advances in computational power have enabled researches to develop new, more complex, service network design models. Some of these new models seek to more accurately represent the operational landscape of a consolidation carrier. For example, while the earliest service network design models did not consider the time dimension at all, current research efforts are modeling time to the hour. Similarly, the initial service network design models assumed model parameter values were known with certainty a priori. Yet now much research is being done to solve models that recognize uncertainty in various parameter values (particularly demands and capacities).

Other advances seek to extend the scope of decisions prescribed by service network design models. For example, researchers are working on service network design models that can also inform strategic decisions such as fleet/resource acquisition and allocation. Other models also negotiate pick-up and drop-off time windows with customers. Finally, researchers are working on models that recognize new transportation infrastructures such as those prescribed by the Physical Internet Initiative. In this talk I will review these new models as well as the solution approaches developed to handle the added complexities. Finally, I will propose what I believe to be the next generation of models that the research community should develop and solve.
LocalSolver is a heuristic solver for large-scale optimization problems. Having modeled your optimization problem using common mathematical operators, LocalSolver provides you with high-quality solutions in short running times. Combining different optimization techniques, LocalSolver scales up to millions of variables, running on basic computers.

One of the strengths of LocalSolver is its rich yet simple modeling framework. Indeed, most usual mathematical operators are available, including arithmetical expressions (sum, product, trigonometric functions) or logical expressions (comparisons, conditional terms, array indexing). As a consequence, there is no need to linearize the considered problem: the user can model it directly and naturally.

Initially this modeling power was based on numerical decision variables only (binary, integer or continuous). A significant extension to this approach was brought in 2015 with the introduction of high level decision variables, inspired from Constraint Programming Set-Based Variables. Many optimization problems involve sequencing or ordering concepts: scheduling, routing, network design. For these problems, a new type of variables yields even simpler and more compact models. The value of such a variable is not a number but a collection of numbers. More precisely, a list variable \( \text{list}(n) \) represents a sub-permutation of the set \( \{0,1,2,\ldots,n-1\} \). We will show in this presentation how this new kind of variables allows building very simple and very effective models for a number of optimization problems, including routing and scheduling problems.

PTV xServer – developer components for logistical and geographical functions

Stefan Hug, Sébastien Beolet – PTV Group

Tuesday, June 7 – 2:00pm

Room: 1 - Kastler

PTV xServer comprises different developer components that offer a broad range of useful logistical and geographical optimization functions. Among others the scope covers trip optimization, field force management, loading space optimization or territory design as well as shortest-path calculation, geocoding and map rendering. The interactive tutorial session will show how easily PTV xServer can be integrated in existing systems and applications to provide basic planning functionality in order to tackle successfully real world problems in the field of transportation logistics. During the session the participants can instantly use PTV xServer and experiment with concrete samples directly on their devices. We will focus on 2 different use-cases. First we present how to calculate the best ETA (Estimated Time of Arrival) for a route. Different featurelayer1 themes representing truck

---

1 for details on feature layer technology we refer to the talk of Yann Bartesch and Sébastien Beolet Generic and scalable annotation layers for shortest path road networks, also at VeRoLog 2016
attributes (e.g. vehicle dimensions and weights) or traffic incidents are taken into account. Furthermore we illustrate how these data sources can be visualized on a map. We also show how further values, like emission calculation or exact toll price reports can be added to the results.

The second use-case concentrates on advanced route planning. Here we demonstrate possibilities to solve various vehicle routing problems. PTV will provide a free academic license for PTV xServer. Further details will be given in the session.

**BRAINSTORMINGS SESSIONS**

**When is a route really feasible in practice?**  
Bas den Heijer and Gerhard Post - ORTEC  
Monday, June 6 - 2:00pm  
Room: 7- Charpak

Optimizing the order of stops in a vehicle route can be challenging enough assuming an easy check for the feasibility of a given route. However, in practice, the conditions that customers and legislation can impose on a route are diverse and mostly very tricky. The basic scientific conditions: time windows for tasks (1), total capacity of the truck (2), and maximum duration of the route (3) all have variants that are highly non-trivial:

1. Consider the best known solutions of the 300 VRPTW benchmarks by Gehring and Homberger. Very small increases of the travel time estimates render all 300 solutions infeasible. Hence a customer requesting robust routes will find these solutions unacceptable.
2. Instead of 1-dimensional loading, the vehicle can have compartments or the loading itself can be a 3-dimensional packing problem.
3. Rules of driving hours, breaks, and rest give additional restrictions on a route, which can depend on the driver driving it.

How to incorporate these conditions while running a routing algorithm is not obvious. We invite the audience to express their opinions on these.

**The VRP with Rhythms**  
Tore Grünert - GTS Systems and Consulting  
Tuesday, June 7 – 2:00pm  
Room: 7 - Charpak

In this workshop I would like to present and discuss an interesting variant of the vehicle routing problem (VRP) that is often encountered in practice. In the VRP with rhythms (VRPR), we are given a number of periods and a number of orders. Each order has a rhythm that specifies the number of periods between two visits. For example, if the rhythm is one, the order has to be executed every period, if it is two, it has to be executed every other period etc. If we take all rhythms into account, the least common multiple (lcm) of all rhythms determines the planning horizon, i.e. the time after which the execution of the orders will repeat. For example, if we...
have orders with rhythms 1, 2, 3 and 4, the lcm is 12, meaning that any rhythmic pattern will repeat after 12 periods. For each order the decision maker can decide about the starting period of the order. For example, if the order has a rhythm of 4 and the starting period is 3, the active periods are 3, 7, 11 etc. Using these starting periods, the active orders are known for each period of the planning horizon.

The task of the VRPR is thus to allocate each order to one route, choose a starting period for the order and to sequence the orders within a ‘master’ route so that the routes that contain the active orders of the period are feasible and cost-optimal over the entire planning horizon. Depending on the application context, the routes usually have to fulfil typical constraints of a VRP, like time windows and capacity constraints. In addition, it is usually required that the workload (capacity utilisation, distance, total route duration) is balanced over the periods.

Very often, the orders have a probability in addition to a rhythm. This means that the customer decides shortly before execution whether the order needs to be executed or not. Note that the VRPR assumes that the allocation to the vehicle and the sequence of the orders in the master route is fixed.

The VRP with rhythms occurs regularly in the waste industry, where different types of waste have different rhythms. Another application area is the planning of service or sales staff. Here, different types of customers may have different service or visitation intervals.

**TECHNICAL SESSIONS**

**Program modifications:**

Despite our best effort, the program may change during the conference due to last-minute cancelations or travel issues. The modifications to the program will be announced every morning. You can also access the modifications online at: [http://verolog2016.sciencesconf.org](http://verolog2016.sciencesconf.org) or simply scan the QR code on the left on your smart phone.

**Guidelines for session chairs**

The role of the Chair is to coordinate the smooth running of the session. The Chair:

- Begins and ends the session on time. Time per presentation is determined by the number of papers in the session. Equal time should be given to each paper.
- Introduces each presentation (just the title of the paper and the name of the presenting author).
- Ensures that presentations are made in the order shown in the program. This allows for "session jumping." If a speaker cancels or does not attend, the original time schedule should be adhered to rather than shifting every talk forward.
Monday - 06/06

11:30 - 12:45

MA1 - Real road networks  
Room: 1 - Kastler  
Chair: Marc Sevaux

11:30 Web services for routing problems  
Sevaux Marc, Bomel Pierre

11:55 Solving the time-and-load dependent green vehicle routing and scheduling problem on real road networks  
Raeesi Ramin, Zografos Konstantinos

12:20 Modelling Vehicle Routing Problems in Real Road Networks  
Ben Ticha Hamza, Absi Nabil, Feillet Dominique, Quilliot Alain

MA2 - Railway applications and others  
Room: 2 - Besse  
Chair: Paolo Toth

11:30 The Timetable Planning Problem for the High Speed Trains of the Chinese Railways  
Cacchiani Valentina, Jiang Feng, Toth Paolo

11:55 A Branch-and-Bound for Speed Optimization in Pickup and Delivery Problem under Track Contention  
Adamo Tommaso, Bektas Tolga, Ghianni Gianpaolo, Guerriero Emanuela, Manni Emanuele

12:20 A Dynamic Programming Approach for Optimizing Train Speed Profiles  
Haahr Jørgen, Pisinger David, Sabbaghian Mohammad

MA3 - Freight transportation  
Room: 3 - Pascal  
Chair: Luigi De Giovanni

11:30 A column generation approach for multi modal operational transportation planning  
Wolfinger David, Tricoire Fabien, Doerner Karl

11:55 A Multi-Resource Routing Problem: Container Delivery in Urban Area  
Ritzinger Ulrike, Hu Bin, Sibincic Aleksandar

12:20 A rich vehicle routing problem in express freight transportation  
De Giovanni Luigi, Gastaldon Nicola, Sottovia Filippo

MA4 - Inventory routing  
Room: 4 - Teillac  
Chair: Claudia Archetti

11:30 Minimizing the logistic ratio in the inventory routing problem  
Archetti Claudia, Desaulniers Guy, Speranza M. Grazia
A Column Generation Framework for Industrial Gas Inventory Routing
Fokouop Rodrigue, André Jean, Traversi Emiliano, Wolfier Calvo Roberto, Létocart Lucas, Baldacci Roberto

A Hybrid Local Search Algorithm for Production Routing Problem
Avci Mustafa, Topaloglu Seyda

MA5 - Waste management
Room: 5 - Galois
Chair: Illya Markov

11:30 The Waste Collection Vehicle Routing Problem with Time Windows and uncertain demands: Model and solution approaches
Tonneau Quentin, Bostel Nathalie, Dejax Pierre, Yeung Thomas

11:55 Waste collection inventory routing with non-stationary stochastic demands
Markov Illya, Maknoon Yousef, Cordeau Jean-François, Varone Sacha, Bierlaire Michel

MA6 - Heuristics
Room: 6 - A002
Chair: Renata Mansini

11:30 Large Neighborhood Search for the Clustered Vehicle Routing Problem
Hintsch Timo, Irnich Stefan

11:55 Heuristic Solutions for a Bicriteria Evacuation Scheduling and Transportation Problem
Deghdak Kaouthar, T’kindt Vincent

12:20 The Directed Profitable Rural Postman Problem with Incompatibility Constraints
Mansini Renata, Colombi Marco, Corberán Angel, Plana Isaac, Sanchis José Maria

14:45 - 16:00

MB1 - Stochastic vehicle routing
Room: 1 - Kastler
Chair: Carlo Filippi

14:45 The Stochastic Multi-period Time Windows Assignment Problem
Côté Jean-François, Raffaele Alice, Mansini Renata

15:10 The probabilistic orienteering problem
Angelelli Enrico, Archetti Claudia, Filippi Carlo, Vindigni Michele

MB2 - Maritime transportation
Room: 2 - Besse
Chair: Xin Wang

14:45 In-port routing and scheduling with stochastic travel times in chemical shipping
Skogen Eline, Elgesem Aurora, Wang Xin, Fagerholt Kjetil
15:10 A Metaheuristic Approach to Fisheries Survey Route Planning
Paias Ana, Mesquita Marta, Wise Laura

**MB3 - Bike and vehicle sharing**
Room: 3 - Pascal
Chair: Ornella Pisacane

14:45 A multi-objective optimization for relocating electric vehicles in car-sharing services
Pisacane Ornella, Bruglieri Maurizio, Pezzella Ferdinando

15:10 Setting Inventory Levels in a Bike Sharing Network
Datner Sharon, Raviv Tal, Tzur Michal, Chemla Daniel

15:35 On finding optimal charging station locations in an electric car sharing system
Brandstätter Georg, Leitner Markus, Ljubic Ivana

**MB4 - City Logistics**
Room: 4 - Teillac
Chair: Patrick-Oliver Groß

14:45 Strategic Fleet Planning for City Logistics
Franceschetti Anna, Honhon Dorothée, Laporte Gilbert, Van Woensel Tom, Fransoo Jan

15:10 A simple LNS-based heuristic for Two-Echelon Routing Problems
Breunig Ulrich, Schmid Verena, Hartl Richard, Vidal Thibaut

15:35 Interval Travel Times for Reliable City Logistics Vehicle Routing
Groß Patrick-Oliver, Ulmer Marlin, Mattfeld Dirk

**MB5 - Split deliveries**
Room: 5 - Galois
Chair: Martin Josef Geiger

14:45 Some ideas and tests of neighborhoods for the split delivery vehicle routing problem
Geiger Martin Josef, Sevaux Marc

15:10 Methods for solving multiple depots split deliveries vehicle routing problems
Santos Andréa Cynthia

16:30 - 17:45

**MC1 - Rich VRP**
Room: 1 - Kastler
Chair: Florian Arnold

16:30 Fleet size and mix split-delivery vehicle routing: a study of MIP formulations
Maheo Arthur, Urli Tommaso, Kilby Philip

16:55 A general and scalable fleet design approach for rich vehicle routing problems
Bertoli Francesco, Kilby Philip, Urli Tommaso
17:20 The multi-product multi-depot vehicle routing problem with inventory restrictions  
Arnold Florian, Sörensen Kenneth

MC2 - City Logistics
Room: 2 - Besse  
Chair: Franziska Heinicke

16:30 From Floating Car Data to Time-Dependent Route Scheduling: a Holistic Methodology  
Heinicke Franziska, Simroth Axel
16:55 Anticipation of Stochastic Travel Times Matrices Changes for Dynamic Vehicle Routing Induced by Emission-Driven Traffic Management  
Köster Felix, Ulmer Marlin, Mattfeld Dirk, Hasle Geir
17:20 Time uncertainties in a city distribution scheme with synchronization  
Anderluh Alexandra, Larsen Rune

MC3 - Supply chain management
Room: 3 - Pascal
Chair: Thierry Benoist

16:30 A compact linear programming model to supply a local bioraffinery  
Ba Birome Holo, Prins Christian, Prdhon Caroline
16:55 Closed-loop Supply Chain Network Design under Demand and Return Uncertainty  
Uster Halit, Hwang Sung
17:20 Designing and optimizing an LNG supply chain using LocalSolver  
Benoist Thierry, Gardi Frederic, Megel Romain, Pajean Clément, Ben Belgacem Michel, Leblanc Delphine, Legrand Frédéric, Pietrasz Slawomir

MC4 - Inventory routing
Room: 4 - Teillac
Chair: Jose Walteros

16:30 A Mathematical Programming Framework that Integrates Customer Decisions within the Distribution Planning of Petroleum Products  
Hsu Yan, Walteros Jose, Batta Rajan
16:55 Lower bound on the logistic ratio objective function for bulk distribution inventory-routing problem  
Jovanovic Tamara, Vasquez Michel, Giroudeau Rodolphe

MC5 - Facility Location
Room: 5 - Galois
Chair: David Cortés Murcia

16:30 Mixed integer formulations for the Green Location Routing Problem  
Cortés-Murcia David, Guerrero William J., Montoya-Torres Jairo R.
16:55 An Integrated Location-Inventory-Routing Problem  
Amiri-Aref Mehdi, Kibi Walid, Babai Zied
**Tuesday - 07/06**

**11:00 - 12:40**

**TA1 - Exact methods**  
Room: 1 - Kastler  
Chair: Jens Lysgaard

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00</td>
<td>A Matheuristic for the MinMax Capacitated Open Vehicle Routing Problem</td>
<td>Lysgaard Jens, López-Sánchez Ana Dolores, Hernández-Díaz Alfredo Garcia</td>
</tr>
<tr>
<td>11:25</td>
<td>A branch and cut for the Hierarchical Mixed Rural Postman Problem</td>
<td>Corberán Angel</td>
</tr>
<tr>
<td>11:50</td>
<td>A Branch &amp; Cut algorithm for the Multi-trip Vehicle Routing Problem with Time Windows</td>
<td>Cattaruzza Diego, Gianessi Paolo</td>
</tr>
</tbody>
</table>

**TA2 - Vehicle routing with time windows**  
Room: 2 - Besse  
Chair: Jeroen Corstjens

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00</td>
<td>A real-world routing and scheduling problem of employees with different skills in multiple working locations</td>
<td>Dragomir Alina-Gabriela, Nolz Pamela, Ritzinger Ulrike, Doerner Karl</td>
</tr>
<tr>
<td>11:25</td>
<td>Unpredictability and inconsistency - routing in the domain of security services</td>
<td>Salzmann Philipp, Schilde Michael, Doerner Karl</td>
</tr>
<tr>
<td>11:50</td>
<td>Analysing metaheuristic algorithms for the vehicle routing problem with time windows</td>
<td>Corstjens Jeroen, Caris An, Depaire Benoît, Sörensen Kenneth</td>
</tr>
</tbody>
</table>

**TA3 - City Logistics**  
Room: 3 - Pascal  
Chair: Jan Fabian Ehmke

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00</td>
<td>Impact of a Mixed Fleet on Urban Emissions Routing</td>
<td>Ehmke Jan Fabian, Campbell Ann, Thomas Barrett</td>
</tr>
<tr>
<td>11:25</td>
<td>Goods Distribution with Electric Vehicles: Integrating Battery Behaviour into Routing</td>
<td>Pelletier Samuel, Laporte Gilbert, Jabali Ola</td>
</tr>
<tr>
<td>11:50</td>
<td>The impact of depot location, fleet composition and routing on emissions in city logistics</td>
<td>Koç Cagri, Bektas Tolga, Jabali Ola, Laporte Gilbert</td>
</tr>
<tr>
<td>12:15</td>
<td>Using tricycles for express deliveries of urgent grocery needs</td>
<td>Schwarzbach Stefan, Nolz Pamela, Ritzinger Ulrike, Hu Bin</td>
</tr>
</tbody>
</table>
TA4 - Inventory routing
Room: 4 - Teillac
Chair: Erdal Aydemir

11:00  Inventory Routing Problem over the long term: a math-heuristic approach
       Absi Nabil, Cattaruzza Diego, Feillet Dominique, Ogier Maxime, Semet Frederic
11:25  Tackling a large production-routing problem in the meat stores of a hypermarket chain
       Neves-Moreira Fábio, Guimarães Luís, Almada-Lobo Bernardo, Jans Raf, Cordeau J.-F.
11:50  Tactical Supply Chain Distribution Planning In The Telecommunications Service Industry
       Desport Pierre, Lardeux Frédéric, Lesaint David, Di Cairano-Gilfedder Carlo
12:15  Smooth Operations in Rugged Supply Chains - Balancing Operations for the Inventory Routing Problem
       Aydemir Erdal, Geiger Martin Josef, Huber Sandra

TA5 - Pickup and delivery
Room: 5 - Galois
Chair: Gerhard Post

11:00  The Third VeRoLog Solver Challenge
       Post Gerhard, Den Heijer Bas
11:25  Horizontal Cooperation in Dial-a-Ride Services
       Molenbruch Yves, Braekers Kri, Caris An
11:50  Two cluster-based approaches for the Pick-up and Delivery Problem with Time Windows
       Al Chami Zaher, Manier Hervé, Manier Marie-Ange, Khalil Mohamad
12:15  Location-allocation and load assignment problem for a package delivery company
       Restrepo Maria I., Semet Frederic, Pocreau Thomas

14:45 - 16:00

TB1 - Dial-a-Ride
Room: 1 - Kastler
Chair: Kris Braekers

14:45  An Adaptive Large Neighborhood Search for the Dial-a-Ride Problem
       Gschwind Timo, Drexl Michael
15:10  The heterogeneous dial-a-ride problem with reconfigurable vehicle capacity
       Tellez Oscar, Vercuraene Samuel, Lehuédé Fabien, Thibaud Monteiro, Péton Olivier
15:35  A multi-period dial-a-ride problem with driver consistency
       Braekers Kris, Kovacs Attila
**TB2 - Healthcare logistics**
Room: 2 - Besse
Chair: Daniele Manerba

14:45 **Biosolver: a VRPTW solver for the nurses tour scheduling problem with hard time constraints**  
*Chrétien Stéphane, Coupey Julien, Nicod Jean-Marc, Varnier Christophe*

15:10 **A Nurse Routing Problem with operational side-constraints**  
*Manerba Daniele, Mansini Renata*

15:35 **Exact and heuristic splitting procedure for fixed sequence services for Home Health Care Routing Problem**  
*Cissé Mohamed, Kergosien Yannick, Lenté Christophe*

**TB3 - TSP variants**
Room: 3 - Pascal
Chair: Claudio Gambella

14:45 **The Interceptor Vehicle Routing Problem: formulation and Branch and Price algorithm**  
*Gambella Claudio, Ghaddar Bissan, Naoum-Sawaya Joe*

15:10 **A heuristic time-bucket approach for solving large-scale TSPTW arising in postal services**  
*Bretin Alexis*

**TB4 - Green vehicle routing and logistics**
Room: 4 - Teillac
Chair: Okan Dukkanci

14:45 **A Mass-flow Based MILP Formulation for the Inventory Routing with Explicit Energy Consumption**  
*He Yun, Jozefowiez Nicolas, Briand Cyril*

15:10 **Green Location Routing Problem**  
*Dukkanci Okan, Y Kara Bahar, Bektas Tolga*

**TB5 - Facility Location**
Room: 5 - Galois
Chair: Maximilian Schiffer

14:45 **Green Hub Location Routing Problem**  
*Bostel Nathalie, Yang Xiao, Dejax Pierre, Paquet Marc*

15:10 **The Location Routing Problem with Intraroute Facilities**  
*Schiffer Maximilian, Walther Grit*

15:35 **A mathematical model for two echelon location routing problem with simultaneous pickup and delivery**  
*Demircan-Yildiz Ece Arzu, Karaoglan Ismail, Altiparmak Fulya*
16:30 - 17:45

TC1 - Rich VRP
Room: 1 - Kastler
Chair: Asvin Goel

16:30 **Combined vehicle routing and truck driver scheduling in the EU and the working time directive**
Asvin Goel

16:55 **VRPTW with European Union regulations**
Naima Belakbir, Bounceur Ahcène, Croguennec Stéphane, Euler Reinhardt, Le Pouliquen Marc, Sevaux Marc, Trevien Jean François

17:20 **VRP++ - A software library for data structures supporting the fast and simple implementation of routing algorithms**
Schönberger Jörn

TC2 - Dynamic vehicle routing
Room: 2 - Besse
Chair: Yann Bartesch

16:30 **Generic and scalable annotation layers for shortest path road networks**
Bartesch Yann, Hug Stefan, Heid Werner

16:55 **Adaptive State Space Partitioning for Dynamic Vehicle Routing Problems**
Schoeffker Ninja, Ulmer Marlin, Mattfeld Dirk

TC3 - Maritime transportation
Room: 3 - Pascal
Chair: Sophie Michel

16:30 **Liner shipping speed optimization with synchronization and port call restrictions**
Reinhardt Line, Plum Christian, Pisinger David

16:55 **Global planning in a multi-terminal and multi-modal maritime container port**
Balev Stefan, Michel Sophie, Sanlaville Eric, Schepler Xavier

17:20 **Robust Supply Vessel Planning with Heuristics**
Kisialiou Yauheni, Gribkovskaia Irina

TC4 - Column generation/branch-and-price
Room: 4 - Teillac
Chair: Ann-Kathrin Rothenbächer

16:30 **A branch-price-and-cut algorithm for the mixed capacitated general routing problem with time windows**
Ciancio Claudio, Laganà Demetrio, Vocaturo Francesca

16:55 **Branch-Price-and-Cut for the Generalized Truck-and-Trailer Routing Problem**
Rothenbächer Ann-Kathrin, Drexl Michael, Irnich Stefan
The Joint Replenishment Problem with Approximated Routing Costs
Baller Annelieke, Dabia Said, Dullaert Wout

TC5 - Facility Location
Room: 5 - Galois
Chair: Werner Heid

16:30 Designing two-echelon distribution networks under demand uncertainty
Ben Mohamed Imen, Vanderbeck François, Klibi Walid
16:55 Detecting location routing problems in geomarketing, sales force optimisation and task planning – Specific challenges of real-life instances
Heid Werner

Wednesday - 08/06

9:15 - 10:30
WA1 - Bike and vehicle sharing
Room: 1 - Kastler
Chair: Bruno Albert Neumann Saavedra

9:15 A matheuristic for the anticipatory service network design of bike sharing systems
Neumann Saavedra Bruno Albert, Römer Michael, Crainic Teodor Gabriel, Gendron Bernard, Mattfeld Dirk Christian
9:40 Modeling Mobility Demands for Bike Sharing Systems
Brinkmann Jan, Ulmer Marlin, Mattfeld Dirk
10:05 Workforce Scheduling and Vehicle Sharing to Reduce Carbon Emissions and Improve Service Quality
Arias Pol, Liu Jiyin, Rana Rupal

WA2 - Collaborative transportation and logistics
Room: 2 - Besse
Chair: M. Grazia Speranza

9:15 The Vehicle Routing Problem with Occasional Drivers
Archetti Claudia, Savelsbergh Martin, Speranza M. Grazia
9:40 Horizontal co-operation in a clustered distribution context
Defryn Christof, Sörensen Kenneth
10:05 Optimization of Inbound and Outbound Delivery Scheduling under Stochastic Dynamic Demand
Cetinkaya Sila, Zhang Liqing, Tekin Eylem
WA3 - Routing with synchronization
Room: 3 - Pascal
Chair: Juliette Medina

9:15 The Split Delivery Vehicle Routing Problem with Time Windows and Synchronization Constraints
Bianchessi Nicola, Drexl Michael, Irnich Stefan, Tilk Christian

9:40 Vehicle routing and scheduling as a resource transfer problem
Weiss Illa, Schwindt Christoph

10:05 Combining load plan design and vehicle routing
Medina Juliette, Hewitt Michael, Lehuede Fabien, Pétéon Olivier

WA4 - Shortest path problems
Room: 4 - Teillac
Chair: Axel Parmentier

9:15 Label Setting algorithm with Dynamic update of Pareto Front
Giret Antoine, Kergosien Yannick, Neron Emmanuelle, Sauvanet Gael

9:40 Integrated Aircraft Routing and Crew Pairing at Air France
Parmentier Axel, Meunier Frédéric

10:05 Heuristics for the bi-objective Unidirectional Road Network Design Problem with Disruptions
Huang Yipeng, Santos Andréea Cynthia, Duhamel Christophe

WA5 - Technician routing
Room: 5 - Galois
Chair: Alejandro Montoya

9:15 Iterated local search for the workforce scheduling and routing problem
Xie Fulin, Potts Chris, Bektas Tolga

9:40 The technician routing problem with conventional and electric vehicles
Montoya Alejandro, Guéret Christelle, Mendoza Jorge E., Villegas Juan G.

10:05 An Iterated Local Search Algorithm for Traveling Repairman Problem with Profits
Avci Mualla Gonca, Avci Mustafa

WA6 - Green vehicle routing and logistics
Room: 6 - A002
Chair: Richard Eglese

9:15 A Parallel Multi-Start NSGA II Algorithm for the Solution of Multiobjective Route-based Fuel Consumption Open Vehicle Routing Problems
Psychas Iraklis - Dimitrios, Marinaki Magdalene, Marinakis Yannis, Matsatsinis Nikolaos

9:40 The Green Load Dependant Vehicle Routing Problem with Backhauls: A Revisited Case Study
Bellosa Javier, Juan Angel, Faulin Javier, Serrano Adrian
10:05 **Modelling choices in Green Vehicle Routing**  
*Eglese Richard*

11:00 - 12:40

**WB1 - Freight transportation**  
Room: 1 - Kastler  
Chair: Gustavo Bula

11:00 **Total Risk Routing Minimization for the Fleet Size and Mix Problem for Hazardous Materials Distribution**  
*Bula Gustavo, Prodhon Caroline, Gonzalez Fabio, Afsar Hasan, Velasco Nubia*

11:25 **A MIP formulation for a Rich Vehicle Routing Problem in the food retailing industry**  
*Tamke Felix*

**WB2 - Multi-objective VRPs**  
Room: 2 - Besse  
Chair: Geir Hasle

11:00 **Equity Objectives in Vehicle Routing: A Survey and Analysis**  
*Mati Piotr, Vidal Thibaut, Hartl Richard*

11:25 **A Memetic Algorithm for the Mixed Capacitated General Routing Problem with Route Balancing**  
*Halvorsen-Weare Elin, Hasle Geir, Lyckander Ingvild, Schulz Christian*

11:50 **A Two-Phase Heuristic Approach for the Biobjective k-Dissimilar Vehicle Routing Problem**  
*Zajac Sandra*

12:15 **Bi-objective optimization of vehicle routing problem for distribution of perishable food: A goal programming approach**  
*Yapar Ufuk, Altiparmak Fulya*

**WB3 - Ports and logistics**  
Room: 3 - Pascal  
Chair: Fabien Tricoire

11:00 **Optimization of a multimodal container transport network: application to the hinterland of the port of Shanghai**  
*Zhao Yulong, Bostel Nathalie, Chen Lu, Dejax Pierre*

11:25 **Lower Bounds for the Container Ship Stowage Planning Problem**  
*Roberti Roberto, Pacino Dario*

11:50 **Managing the Flow of Containers in a Multimodal Network**  
*Hemmidy Mohamed, Yassine Adnan, Joncour Cédric, Michel Sophie*

12:15 **New advances for the block relocation problem**  
*Tricoire Fabien, Beham Andreas, Fechter Judith*
**WB4 - Inventory routing**  
Room: 4 - Teillac  
Chair: Demetrio Laganà

11:00 *An Exact Method for the Periodic Inventory Routing Problem in a Lean Production System*  
Laganà Demetrio, Bertazzi Luca, Ohlmann Jeffrey, Ventura Domenico

11:25 *Fleet sizing and cyclic delivery scheduling for in-plant inventory routing*  
Duman Necati Oguz, Kuyzu Gultekin

11:50 *An efficient algorithm for the Cyclic Inventory Routing Problem subproblem*  
Lefever Wouter, Hadj-Hamou Khaled, Aghezzaf El-Houssaine

**WB5 - Rich VRP**  
Room: 5 - Galois  
Chair: Bruce Golden

11:00 *Some Exciting New Problems in Vehicle Routing*  
Vigo Daniele, Golden Bruce

11:25 *Integrated Production and Outbound Distribution Planning in the Automotive Industry*  
Zesch Felix, Hellingrath Bernd

11:50 *Formulation and value of an integrated order picking-vehicle routing problem*  
Moons Stef, Ramaekers Katrien, Caris An

12:15 *Scheduling resource-constrained projects with transportation constraints*  
Lacomme Philippe, Moukrim Aziz, Quillot Alain, Vinot Marina

**WB6 - Meta-heuristics**  
Room: 6 - A002  
Chair: Lukas Bach

11:00 *Adaptive Memory Programming for the Multi-Product Vehicle Routing Problem with Cross-Docking*  
Nikolopoulou Amalia, Repoussis Panagiotis, Tarantilis Christos, Zachariadis Emmanouil

11:25 *Solving the Multi-Vehicle Covering Tour Problem with a Dynamic Programming-Based Operator*  
Vargas Leticia, Jozefowiez Nicolas, Ngueveu Sandra

11:50 *GPU parallelization of ALNS for the DCVRP*  
Bach Lukas, Hasle Geir, Schulz Christian

12:15 *The capacitated vehicle routing problem with sequence-based pallet loading and axle weight constraints*  
Pollaris Hanne, Braekers Kris, Caris An, Janssens Gerrit K., Limbourg Sabine
14:00 - 15:40

WC1 - CVRP
Room: 1 - Kastler
Chair: Jan Christiaens

14:00 **A genetic algorithm based approach to vehicle routing problem with indirect deliveries in humanitarian logistics**
   Clavijo Lopez Christian, Labadie Nacima, Prodhon Caroline
14:25 **A ruin & recreate approach to the capacitated vehicle routing problem**
   Christiaens Jan, Vanden Berghe Greet

WC2 - Exact methods
Room: 2 - Besse
Chair: Enrique Benavent

14:00 **The Prize-Collecting Vehicle Routing Problem with Setup Costs and Service Level Requirements**
   Orlis Christos, Dullaert Wout, Laganà Demetrio, Vigo Daniele
14:25 **Dynamic path generation for the Proactive Route Guidance approach**
   Morandi Valentina, Savaelsbergh Martin, Angelelli Enrico, Speranza M. Grazia
14:50 **Experiments with different formulations for the Capacitated Arc Routing Problem**
   Benavent Enrique, Belenguer Jose M., Corberán Angel, Plana Isaac, Sanchis José. M.

WC3 - Routing with synchronization
Room: 3 - Pascal
Chair: Stefan Irnich

14:00 **The Active-Passive Vehicle-Routing Problem, Part I: Solution by Column Generation**
   Tilk Christian, Bianchessi Nicola, Drexel Michael, Irnich Stefan, Meisel Frank
14:25 **The Active-Passive Vehicle-Routing Problem, Part II: Comparison of Column-Generation Subproblem Solvers**
   Tilk Christian, Bianchessi Nicola, Drexel Michael, Irnich Stefan, Meisel Frank
14:50 **A large neighborhood based matheuristic for the vehicle routing problem with cross-docking and dock resource constraints**
   Grangier Philippe, Gendreau Michel, Lehuédé Fabien, Rousseau Louis-Martin
15:15 **Heuristics for routes duration minimization in full truckload routing with resource synchronization**
   Grimault Axel, Bostel Nathalie, Lehuédé Fabien
WC4 - Vehicle routing with time windows
Room: 4 - Teillac
Chair: Katharina Glock

14:00 A variable neighborhood tabu search algorithm for the Vehicle Routing Problem with Multiple Time Windows
Hoogeboom Maaike, Dullaert Wout, Lai David, Vigo Daniele
14:25 A Benders based heuristic for a m-TSP with multiple time windows and selective cities
Mesquita Marta, Paias Ana
14:50 A Matheuristic Approach for Solving the Electric Vehicle Routing Problem with Time Windows and Fast Recharges
Keskin Merve, Çatay Bülent
15:15 New techniques for Constraint Programming based heuristics for VRP
Glock Katharina, Meyer Anne, Tack Guido

WC5 - Stochastic vehicle routing
Room: 5 - Galois
Chair: Alexandre Florio

14:00 A Local Branching Matheuristic for the Multi-Vehicle Routing Problem with Stochastic Demands
Jabali Ola, Hernandez Florent, Gendreau Michel, Rei Walter
14:25 Fast robust solutions to stochastic VRPs using SIMD instructions
Larsen Rune
14:50 The pollution-routing problem with stochastic travel times
Nasri Moncef Ilies, Bektas Tolga, Laporte Gilbert
15:15 The stochastic delivery problem: introduction and solution by branch-and-price
Florio Alexandre, Hartl Richard, Feillet Dominique
SPEAKER INDEX

T. Adamo - Mon., 11:55 - 2 - Besse
Z. Al Chami - Tue., 11:50 - 5 - Galois
M. Amiri-Aref - Mon., 16:55 - 5 - Galois
A. Anderlüh - Mon., 17:20 - 2 - Besse
C. Archetti - Mon., 11:30 - 4 - Teillac
P. Arias - Wed., 10:05 - 1 - Kastler
F. Arnold - Mon., 17:20 - 1 - Kastler
M. Avci - Mon., 12:20 - 4 - Teillac
E. Aydemir - Tue., 12:15 - 4 - Teillac
L. Bach - Wed., 11:50 - 6 - A002
A. Baller - Tue., 17:20 - 4 - Teillac
Y. Bartesch - Tue., 16:30 - 2 - Besse
I. Ben Mohamed - Tue., 16:30 - 5 - Galois
H. Ben Ticha - Mon., 12:20 - 1 - Kastler
E. Benavenat - Wed., 14:50 - 2 - Besse
T. Benoist - Mon., 17:20 - 3 - Pascal
F. Bertoli - Mon., 16:55 - 1 - Kastler
N. Bianchessi - Wed., 09:15 - 3 - Pascal
K. Braekers - Tue., 15:35 - 1 - Kastler
G. Brandstätter - Mon., 15:35 - 3 - Pascal
A. Bretin - Tue., 15:10 - 3 - Pascal
U. Breunig - Mon., 15:10 - 4 - Teillac
G. Bula - Wed., 11:00 - 1 - Kastler
D. Cattaruzza - Tue., 11:50 - 1 - Kastler
S. Cetinkaya - Wed., 10:05 - 2 - Besse
J. Christiaens - Wed., 14:25 - 1 - Kastler
M. Cissé - Tue., 15:35 - 2 - Besse
C. Clavijo López - Wed., 14:00 - 1 - Kastler
A. Corberán - Tue., 11:25 - 1 - Kastler
J. Corstjens - Tue., 11:50 - 2 - Besse
D. Cortés-Murcia - Mon., 16:30 - 5 - Galois
J. Côté - Mon., 14:45 - 1 - Kastler
J. Coupey - Tue., 14:45 - 2 - Besse
L. De Giovanni - Mon., 12:20 - 3 - Pascal
C. Defryn - Wed., 09:40 - 2 - Besse
K. Deghdak - Mon., 11:55 - 6 - A002
E. Demircan-Yildiz - Tue., 15:35 - 5 - Galois
P. Desport - Tue., 11:50 - 4 - Teillac
A. Dragomir - Tue., 11:00 - 2 - Besse
O. Dukkanci - Tue., 15:10 - 4 - Teillac
R. Eglese - Wed., 10:05 - 6 - A002
J. Ehmke - Tue., 11:00 - 3 - Pascal
J. Faulin - Wed., 09:40 - 6 - A002
C. Filippi - Mon., 15:10 - 1 - Kastler
A. Florio - Wed., 15:15 - 5 - Galois
R. Fokouop - Mon., 11:55 - 4 - Teillac
A. Franceschetti - Mon., 14:45 - 4 - Teillac
C. Gambella - Tue., 14:45 - 3 - Pascal
M. Geiger - Mon., 14:45 - 5 - Galois
A. Giret - Wed., 09:15 - 4 - Teillac
K. Glock - Wed., 15:15 - 4 - Teillac
A. Goel - Tue., 16:30 - 1 - Kastler
B. Golden - Wed., 11:00 - 5 - Galois
M. Gonca Avci - Wed., 10:05 - 5 - Galois
P. Grangier - Wed., 14:50 - 3 - Pascal
A. Grimault - Wed., 15:15 - 3 - Pascal
P. Groß - Mon., 15:35 - 4 - Teillac
T. Gschwind - Tue., 14:45 - 1 - Kastler
J. Haahr - Mon., 12:20 - 2 - Besse
G. Hasle - Wed., 11:25 - 2 - Besse
Y. He - Tue., 14:45 - 4 - Teillac
W. Heid - Tue., 16:55 - 5 - Galois
F. Heinicke - Mon., 16:30 - 2 - Besse
M. Hemmidy - Wed., 11:50 - 3 - Pascal
T. Hintsch - Mon., 11:30 - 6 - A002
B. Holo Ba - Mon., 16:30 - 3 - Pascal
M. Hoogeboom - Wed., 14:00 - 4 - Teillac
B. Hu - Tue., 12:15 - 3 - Pascal
Y. Huang - Wed., 10:05 - 4 - Teillac
S. Irnich - Wed., 14:25 - 3 - Pascal
O. Jabali - Wed., 14:00 - 5 - Galois
T. Jovanovic - Mon., 16:55 - 4 - Teillac
M. Keskin - Wed., 14:50 - 4 - Teillac
Y. Kisialiou - Tue., 17:20 - 3 - Pascal
C. Koç - Tue., 11:50 - 3 - Pascal
F. Köster - Mon., 16:55 - 2 - Besse
P. Lacomme - Wed., 12:15 - 5 - Galois
D. Laganà - Wed., 11:00 - 4 - Teillac
R. Larsen - Wed., 14:25 - 5 - Galois
W. Lefever - Wed., 11:50 - 4 - Teillac
J. Lysgaard - Tue., 11:00 - 1 - Kastler
A. Maheo - Mon., 16:30 - 1 - Kastler
D. Manerba - Tue., 15:10 - 2 - Besse
R. Mansini - Mon., 12:20 - 6 - A002
Y. Marinakis - Wed., 09:15 - 6 - A002
I. Markov - Mon., 11:55 - 5 - Galois
P. Matl - Wed., 11:00 - 2 - Besse
D. Mattfeld - Wed., 09:40 - 1 - Kastler
J. Medina - Wed., 10:05 - 3 - Pascal
M. Mesquita - Wed., 14:25 - 4 - Teillac
S. Michel - Tue., 16:55 - 3 - Pascal
Y. Molenbruch - Tue., 11:25 - 5 - Galois
A. Montoya - Wed., 09:40 - 5 - Galois
S. Moons - Wed., 11:50 - 5 - Galois
V. Morandi - Wed., 14:25 - 2 - Besse
B. Naima - Tue., 16:55 - 1 - Kastler
M. Nasri - Wed., 14:50 - 5 - Galois
B. Neumann Saavedra - Wed., 09:15 - 1 - Kastler
F. Neves-Moreira - Tue., 11:25 - 4 - Teillac
A. Nikolopoulou - Wed., 11:00 - 6 - A002
M. Ogier - Tue., 11:00 - 4 - Teillac
N. Oguz Duman - Wed., 11:25 - 4 - Teillac
C. Orlis - Wed., 14:00 - 2 - Besse
A. Paias - Mon., 15:10 - 2 - Besse
A. Parmentier - Wed., 09:40 - 4 - Teillac
S. Pelletier - Tue., 11:25 - 3 - Pascal
O. Pisacane - Mon., 14:45 - 3 - Pascal
H. Pollaris - Wed., 12:15 - 6 - A002
G. Post - Tue., 11:00 - 5 - Galois
R. Raeesi - Mon., 11:55 - 1 - Kastler
T. Raviv - Mon., 15:10 - 3 - Pascal
L. Reinhardt - Tue., 16:30 - 3 - Pascal
M. Restrepo - Tue., 12:15 - 5 - Galois
U. Ritzinger - Mon., 11:55 - 3 - Pascal
R. Roberti - Wed., 11:25 - 3 - Pascal
A. Rothenbächer - Tue., 16:55 - 4 - Teillac
P. Salzmann - Tue., 11:25 - 2 - Besse
A. Santos - Mon., 15:10 - 5 - Galois
M. Schiffer - Tue., 15:10 - 5 - Galois
J. Schönberger - Tue., 17:20 - 1 - Kastler
M. Sevaux - Mon., 11:30 - 1 - Kastler
N. Soeffker - Tue., 16:55 - 2 - Besse
M. Speranza - Wed., 09:15 - 2 - Besse
F. Tamke - Wed., 11:25 - 1 - Kastler
O. Tellez - Tue., 15:10 - 1 - Kastler
C. Tilik - Wed., 14:00 - 3 - Pascal
Q. Tonneau - Mon., 11:30 - 5 - Galois
P. Toth - Mon., 11:30 - 2 - Besse
F. Tricoire - Wed., 12:15 - 3 - Pascal
H. Uster - Mon., 16:55 - 3 - Pascal
L. Vargas - Wed., 11:25 - 6 - A002
F. Vocaturo - Tue., 16:30 - 4 - Teillac
J. Walteros - Mon., 16:30 - 4 - Teillac
X. Wang - Mon., 14:45 - 2 - Besse
I. Weiss - Wed., 09:40 - 3 - Pascal
D. Wolfinger - Mon., 11:30 - 3 - Pascal
F. Xie - Wed., 09:15 - 5 - Galois
X. Yang - Tue., 14:45 - 5 - Galois
U. Yapar - Wed., 12:15 - 2 - Besse
S. Zajac - Wed., 11:50 - 2 - Besse
F. Zesch - Wed., 11:25 - 5 - Galois
Y. Zhao - Wed., 11:00 - 3 - Pascal
What is VRP-REP?

VRP-REP is an open data platform for sharing vehicle routing problem benchmark instances and solutions.

What can you do with VRP-REP?

- Upload VRP instances in a pre-defined format (the VRP-REP instance specification) or your own format
- Share instances with other users or the general public
- Share instances privately with referees and editors during the reviewing process
- Share your solutions with the community
- Download instances shared by other users
- Track the best known solutions for registered datasets
- Subscribe to notifications of newly contributed datasets and solutions
- Access open-source code for solution checking and instance generation
- Propose extensions and enhancements to the VRP-REP instance specification
- Browse the VRP-REP database of VRP publications

Join the nearly 250 current users and start sharing your VRP data now!