GRÉGORY MARLIÈRE

Ingénieur expert en informatique et optimisation pour l'exploitation ferroviaire

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EXPÉRIENCE

Ingénieur d'études Hors Classe

Université Gustave Eiffel

depuis 2001 Villeneuve d'Ascq

- Gestion de projets, conception d'algorithmes d'optimisation, expérimentations et analyses statistiques, publications.
- Encadrement d'élèves ingénieurs et enseignement ponctuel.
- Correspondant informatique et web, administration de serveurs de calculs.
- Représentant élu du personnel, membre de jurys de concours.

PROJETS

Responsable de la plate-forme expérimentale Recife pour la gestion de trafic ferroviaire

- *depuis 2018* : **Concepteur** du modèle de gestion opérationnelle de trafic ferroviaire ***Recife-CPI*** **notamment validé en 2023 par la parution d'un article dans la revue "Control Engineering Practice"**.
- *depuis 2012* : Participation à la conception, mise au point et aux évolutions de l'algorithme *Recife-MILP* utilisant les techniques de programmation linéaire en variables mixtes. **Implication dans plus de 15 publications relatives à ce modèle**.
- *depuis 2010* : Conception et réalisation de l'interface logicielle permettant la connexion temps-réel entre le simulateur ferroviaire *Open-Track* et les algorithmes développés en interne. **La maîtrise des simulations connectées a permis l'obtention de nombreux projets de recherche et d'études dans notre équipe**.
- *depuis 2001* : Réalisation des extensions du modèle *Recife-PPC* et des outils graphiques de démonstration et d'analyse.

Projets européens notables

- *Sorted-Mobility* (en cours) : développement d'un module de simulation des flux passagers et de leurs décisions de correspondances, mise au point du cas d'étude de Copenhague.
- *ON-TIME* (2011-2014) : Implication dans 3 work-packages, responsable des tâches "Algorithms and tools for automatic conflict detection and resolution" et "Benchmarking and system integration through on-line simulation".

Projets nationaux notables

Chef de projet (rédaction des offres, montage, mise en oeuvre et rédaction des livrables) :

- *RER BD 2025* (2020-2022, SNCF) : Estimation des gains apportés par la signalisation NexTEO (pilotage automatique).
- *Fluidification des circulations transilien* (2016-2019, SNCF I&R) : évaluation et mise au point d'un algorithme de gestion des temps d'arrêts en gare des RER A et C.

COMPÉTENCES

Ingénierie logicielle | Gestion de projets | Recherche opérationnelle | Analyse statistique | Simulation ferroviaire

ENSEIGNEMENT

Mastère Ferroviaire

Module "Gestion des circulations et allocation des ressources"

2011 à 2014 ENPC

Master international "Urban Engineering and Habitat"

Module "Transport Network Management"

2012 a 2014 USTL

LANGUES

Anglais ●●●●○

Allemand ●○○○○

DIPLOMES

Licence Professionnelle, spécialité informatique IPS

2001 USTL

DUT Génie Électrique et informatique industrielle

2000 USTL

CENTRES D'INTÉRÊT

Course à pied | Photographie | Trekking

PUBLICATIONS

Chapitres d'ouvrages

- J. Rodriguez, **G. Marlière**, S. Sobieraj, and F. Zann, *Innovations dans les transports guidés urbains et régionaux*. Hermès, 2009, ch. 4 :Optimisation de la gestion des circulations dans une gare de métropole.

Articles de revues

- **G. Marlière**, S. Sobieraj Richard, P. Pellegrini, and J. Rodriguez, "A conditional time-intervals formulation of the real-time railway traffic management problem," *Control Engineering Practice*, vol. 133, p. 105 430, 2023, ISSN: 0967-0661. DOI: https://doi.org/10.1016/j.conengprac.2022.105430.
- P. Pellegrini, **G. Marlière**, and J. Rodriguez, "Recife-sat: A milp-based algorithm for the railway saturation problem," *Journal of Rail Transport Planning and Management*, vol. 7, no. 1, pp. 19–32, 2017, ISSN: 2210-9706. DOI: https://doi.org/10.1016/j.jrtpm.2017.08.001.
- P. Pellegrini, **G. Marlière**, and J. Rodriguez, "A detailed analysis of the actual impact of real-time railway traffic management optimization," *Journal of Rail Transport Planning and Management*, vol. 6, no. 1, pp. 13–31, 2016, ISSN: 2210-9706. DOI: https://doi.org/10.1016/j.jrtpm.2016.01.002.
- E. Quaglietta, P. Pellegrini, R. M. Goverde, *et al.*, "The on-time real-time railway traffic management framework: A proof-of-concept using a scalable standardised data communication architecture," *Transportation Research Part C: Emerging Technologies*, vol. 63, pp. 23–50, 2016, ISSN: 0968-090X. DOI: https://doi.org/10.1016/j.trc.2015.11.014.
- P. Pellegrini, **G. Marlière**, R. Pesenti, and J. Rodriguez, "Recife-milp: An effective milp-based heuristic for the real-time railway traffic management problem," *IEEE Transactions on Intelligent Transportation Systems*, vol. 16, no. 5, pp. 2609–2619, 2015. DOI: 10.1109/TITS.2015.2414294.
- P. Pellegrini, **G. Marlière**, and J. Rodriguez, "Optimal train routing and scheduling for managing traffic perturbations in complex junctions," *Transportation Research Part B: Methodological*, vol. 59, pp. 58–80, 2014, ISSN: 0191-2615. DOI: https://doi.org/10.1016/j.trb.2013.10.013.
- J. Rodriguez, P. Pellegrini, **G. Marlière**, S. Hu, and S. S. Richard, "Improvement of real-time traffic management by using optimization tools," *Procedia - Social and Behavioral Sciences*, vol. 160, pp. 465–473, 2014, XI Congreso de Ingenieria del Transporte (CIT 2014), ISSN: 1877-0428. DOI: https://doi.org/10.1016/j.sbspro.2014.12.159.
- J. Rodriguez, X. Delorme, X. Gandibleux, *et al.*, "Modèles et outils pour l'analyse de la capacité ferroviaire," *Recherche Transports Sécurité*, vol. 95, Lavoisier, Ed., pp. 19–36, Sep. 2007. [Online]. Available: https://doi.org/10.3166/rts.95.129-146.

Actes de conférences (10 dernières années)

- Y. Xiajie, **G. Marlière**, P. Pellegrini, J. Rodriguez, and R. Pesenti, "An iterative algorithm for the coordinated train rerouting and rescheduling problem," in *23ème congrès annuel de la Société Française de Recherche Opérationnelle et d'Aide à la Décision*, INSA Lyon, Villeurbanne - Lyon, France, Feb. 2022. [Online]. Available: https://hal.science/hal-03595243.
- **G. Marliere**, S. Sobieraj Richard, P. Pellegrini, and J. Rodriguez, "A Conditional Time-Intervals formulation of the real-time Railway Traffic Management Problem," in *CTS 2021, 16th IFAC Symposium on Control in Transportation Systems*, CTS 2021, 16th IFAC Symposium on Control in Transportation Systems, Lille, FRANCE, 08-/06/2021 - 10/06/2021, vol. 54, Lille, France: Elsevier, Jun. 2021, pp187–194. DOI: 10.1016/j.ifacol.2021.06.046.
- **G. Marliere**, S. Sobieraj Richard, P. Pellegrini, and J. Rodriguez, "A new Constraint Based Scheduling model for real-time Railway Traffic Management Problem using conditional Time-Intervals," in *Rail Norrköping 2019, 8th International Conference on Railway Operations Modelling and Analysis (ICROMA)*, Rail Norrköping 2019, 8th International Conference on Railway Operations Modelling and Analysis (ICROMA), Norrköping, SUEDE, 17-/06/2019 - 20/06/2019, Norrköping, France, Jun. 2019, 20p. [Online]. Available: https://hal.science/hal-02179336.
- P. Pellegrini, **G. Marliere**, R. Pessenti, and J. Rodriguez, "Boosting the performance of railway traffic management through the reformulation of RECIFE-MILP," in *7th International Conference on Railway Operations Modelling and Analysis - Rail Lille*, 7th International Conference on Railway Operations Modelling and Analysis - Rail Lille, Lille, France, 04-/04/2017 - 07/04/2017, Lille, France, Apr. 2017, 16p. [Online]. Available: https://hal.science/hal-01470348.
- P. Pellegrini, **G. Marlière**, R. Pesenti, and J. Rodriguez, "A milp reformulation for train routing and scheduling in case of perturbation," in *Optimization and Decision Science: Methodologies and Applications*, A. Sforza and C. Sterle, Eds., Cham: Springer International Publishing, 2017, pp. 495–503, ISBN: 978-3-319-67308-0.
- P. Pellegrini, **G. Marliere**, and J. Rodriguez, "RECIFE-MILP for real-time railway traffic optimization: main results and open issues," in *WCRR 2016, 11th World Congress of Railway Research*, WCRR 2016, 11th World Congress of Railway Research, Milan, Italie, 29-/05/2016 - 02/06/2016, Milan, Italy, May 2016, 7p. [Online]. Available: https://hal.science/hal-01342985.

- E. Quaglietta, R. Goverde, T. Albrecht, *et al.*, “Optimal Management of Railway Perturbations by Means of an Integrated Support System for Real-Time Traffic Control,” in *6th International Conference on Railway Operations Modelling and Analysis - RailTokyo2015, ICROR*, 6th International Conference on Railway Operations Modelling and Analysis - RailTokyo2015, ICROR, Tokyo, Japon, 23-/03/2016 - 27/03/2016, Tokyo, Japan, Mar. 2016, pp. -. [Online]. Available: https://hal.science/hal-01263418.
- P. Pellegrini, **G. Marliere**, and J. Rodriguez, “Analysis of the robustness of real-time railway traffic management optimization,” in *RailTokyo2015, 6th International Conference on Railway Operations Modelling and Analysis*, RailTokyo2015, 6th International Conference on Railway Operations Modelling and Analysis, Tokyo, JAPON, 23-/03/2015 - 26/03/2015, Tokyo, Japan, Mar. 2015, 16p. [Online]. Available: https://hal.science/hal-01471400.
- P. Pellegrini, **G. Marliere**, and J. Rodriguez, “Real-time railway traffic management optimization and imperfect information: preliminary studies,” in *International Conference on Industrial Engineering and Systems Management, IESM 2015*, International Conference on Industrial Engineering and Systems Management, IESM 2015, Séville, Espagne, 21-/10/2015 - 23/10/2015, Séville, Spain, Oct. 2015, 6p. [Online]. Available: https://hal.science/hal-01266973.
- **G. Marliere**, E. M. El Koursi, and J. L. Bruyelle, “Resilience of metro vehicle to blast events,” in *ISTS 2014 - International Symposium of Transport Simulation*, France, Jun. 2014, 1p. [Online]. Available: https://hal.science/hal-00995399.
- **G. Marlière**, P. Pellegrini, and J. Rodriguez, “Simulation of an innovative management of freight trains,” in *ISTS 2014 - International Symposium of Transport Simulation*, France, Jun. 2014, 3p. [Online]. Available: https://hal.science/hal-00993677.
- P. Pellegrini, **G. Marliere**, S. Sobieraj, and J. Rodriguez, “Optimization for the real-time railway traffic management: case studies in European networks,” in *IFORS 2014 - 20th Conference of the International Federation of Operational Research Societies*, Spain, Jul. 2014, 13p. [Online]. Available: https://hal.science/hal-01061387.
- P. Pellegrini, **G. Marlière**, and J. Rodriguez, “Optimal train routing and scheduling in case of traffic perturbations: improving solution time through parameter tuning,” in *TRA - Transport Research Arena*, France, Apr. 2014, 9p. [Online]. Available: https://hal.science/hal-00993599.
- P. Pellegrini, J. Rodriguez, **G. Marlière**, S. Hu, and S. Sobieraj, “Real-time railway traffic management through optimisation tools,” in *15th conference ROADEF of the French society of operations research et decision aid*, France, Feb. 2014, 14p. [Online]. Available: https://hal.science/hal-00990379.
- J. Rodriguez, P. Pellegrini, **G. Marliere**, S. Hu, and S. Sobieraj, “Improvement of real-time traffic management by using optimization tools,” in *CIT 2014, XI Congreso de Ingenieria del Transporte*, Spain, Jun. 2014, 16p. [Online]. Available: https://hal.science/hal-00993723.
- P. Pellegrini, G. Douchet, **G. Marliere**, and J. Rodriguez, “Real-time train routing and scheduling through mixed integer linear programming: Heuristic approach,” in *IESM 2013, 5th international conference on industrial engineering and system management*, Morocco, Oct. 2013, 6p. [Online]. Available: https://hal.science/hal-00909493.
- P. Pellegrini, **G. Marliere**, and J. Rodriguez, “A mixed-integer linear program for the real-time railway traffic management problem:quantification of the impact of a priori platform assignment,” in *ROADEF 2013*, France, Feb. 2013, 2p. [Online]. Available: https://hal.science/hal-00912500.
- P. Pellegrini, **G. Marliere**, and J. Rodriguez, “Boosting the performance of a MILP formulation for railway traffic management in complex junctions,” in *MT-ITS 2013, Models and Technologies for Intelligent Transportation Systems*, Germany, Dec. 2013, p419–428. [Online]. Available: https://hal.science/hal-00918197.
- P. Pellegrini, **G. Marlière**, and J. Rodriguez, “A mixed-integer linear program for the real-time railway traffic management problem modeling track-circuits,” in *IAROR, 5th International Seminar on Railway Operations Modelling and Analysis, RailCopenhagen 2013*, Denmark, May 2013, 18p. [Online]. Available: https://hal.science/hal-00851175.
- P. Pellegrini, **G. Marlière**, and J. Rodriguez, “Configuring a MILP formulation for rail traffic management,” in *EURO-INFORMS conference 2013*, Italy, Jul. 2013, 1p. [Online]. Available: https://hal.science/hal-00912490.

Rapport notable

- **G. Marliere**, P. Pellegrini, and J. Rodriguez, “Livrable Phare du COP 12-16 : Conception de nouvelles stratégies de régulation du trafic ferroviaire pour l’aide à la décision,” IFSTTAR - Institut Français des Sciences et Technologies des Transports, de l’Aménagement et des Réseaux, Research Report, Jan. 2017, 19p. [Online]. Available: https://hal.science/hal-01526216.

18/11/2014

Letter of recommendation for Mr. Gregory Marlière

To whom it may concern

During the European research project ON-TIME ("Optimal Networks for Train Integration Management in Europe") I lead the work package on "Real-Time Management of Small Perturbations". In that function I worked with Gregory Marlière for 2.5 years (05/2012-11/2014). Gregory's main achievement was the successful software integration of the conflict detection and resolution tool RECIFE developed at IFSTTAR in the modular traffic management architecture designed in this workpackage. Furthermore he was strongly involved with the real-time demonstration of these software tools with the microscopic railway traffic simulation HERMES of Graffica Ltd.
In particular, his tasks were:

- contribution of ideas to the architecture development
- contribution of texts to the deliverables "Functional and technical requirements on real-time perturbation management" (D4.1) and "Tools and algorithms for real-time perturbation management" (D4.2)
- early stage user of the HERMES simulation software: he quickly understood the principles (and bottlenecks) of the simulation and was able to share his insights with the other contributors of the work package thereby enabling a fast adoption of the HERMES simulator and the control principles among the workpackage partners
- automatic generation, execution and evaluation of scenarios in HERMES
- developed a platform-independent evaluation tool for the optimization/ simulation allowing to visualize simulation results in a web browser (e.g. blocking time diagram)
- integration of the RECIFE software tool in the architecture, i.e.
  - use of railML 2.2 data (infrastructure, timetable, rolling stock and interlocking data)
  - integration with the web-service based architecture for real-time data exchange
  - generation of the real-time traffic plan from the optimization output
- development and integration tests of the architecture modules together with RECIFE
- contribution to railML development and presentation of ON-TIME railML developments at UIC railML conference in 2013

With his very valuable contributions Gregory was one of the six key members of my work package with about 40 different contributors of top European railway research institutions. He expressed his ideas and thoughts in a calm and precise way which was very much appreciated by the rest of the team. His work was strongly focussed on the overall project success and he devoted much of his time to it. Gregory presented the first closed-loop demonstration to the external expert advisory board which assembled representatives from several major European railways and industry companies.
Beside his most appreciated practical contributions, he published several scientific papers during the project together with his colleagues.
I wish Gregory all the best for his personal future. I will be happy to provide further reference by mobile phone +49 174 328 7773 or email talbrecht@csc.com.

Dr.-Ing. Thomas Albrecht
Business Architect
CSC Deutschland Solutions GmbH
(during the time of project Research fellow at Technische Universität Dresden)

Dr. Rémy Chevrier
Chef de projets SNCF Innovation & Recherche
remy.chevrier@sncf.fr
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Saint-Denis, le 18 octobre 2019,

A qui de droit,

J'ai, à plusieurs reprises, eu le plaisir de travailler avec Grégory Marlière, que j'ai sollicité pour son expertise en simulation ferroviaire (en 2016, 2018 et 2019). Dans le cadre d'un projet de recherche que je conduis pour le compte de SNCF Transilien, Grégory Marlière a réalisé des simulations de haut niveau technique pour évaluer des algorithmes d'optimisation sur plusieurs périmètres SNCF Transilien, en l'occurrence RER A, ligne L et RER C.

Grégory Marlière a réalisé trois ensembles de simulation sur la plate-forme OpenTrack et a procédé à l'analyse des résultats obtenus. Ceux-ci ont permis de conclure sur la pertinence des algorithmes que j'ai conçus pour la gestion du *mass-transit* Transilien et ont contribué à la réalisation de deux démonstrations sur sites en 2017 (sur les lignes RER A et L simultanément). Ces démonstrations se sont révélées très positives et ont validé le principe d'une étude d'industrialisation des concepts développés dans le projet de recherche.

L'excellente qualité du travail d'ingénierie de recherche, réalisé par Grégory Marlière, a été saluée par mes collègues SNCF de Transilien, de la Direction de la Traction et de la Direction Innovation & Recherche. Son travail nous a permis de progresser significativement dans le cadre de ce projet de recherche. Pour toutes ces raisons, je consulterai à nouveau Grégory Marlière pour bénéficier de sa précieuse expertise dans des projets de recherche en exploitation ferroviaire.

Dr. Rémy Chevrier