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introduction

After a PhD thesis focused on fluid dynamics and acoustics (1999) in the civil engineering field, I put my competences in dynamics, fluid mechanics, experiments and simulation into application to the transportation domain, by joining in 2001 the french road and bridges laboratory (LCPC).

Starting from tire-to-road grip to vehicle handling and road safety, my researches have been more focused on transportation energy savings since 2011, concomitantly with the merging of Inrest and LCPC into the Ifsttar institute. My research field became then the use phase of transportation infrastructure, whether for railways and roads. General aim is the reduction of use phase energies, due to traveling of trains or road vehicles, by means of a better infrastructure design or exploitation.

Since january 2020 the institute I belonged to is now part of the new french Gustave Eiffel University.

Employment History

- 2020 – **Senior researcher.** Gustave Eiffel University, Nantes Campus, Bouguenais.
- 2011 – 2019 **Researcher. (energy, infrastructure, transportation)** Ifsttar, French science, network and transportation institute, Bouguenais, France.
- 2001 – 2011 **Researcher. (road safety)** LCPC, French road and bridges central laboratory, Bouguenais, France. I
- 2000 – 2001 **Post doctorate.** CSTB, french building research center, Nantes, France.
- 1999 – 2000 **Research and teaching assistant.** La Rochelle University, France.
- 1996 – 1999 **Assistant teacher.** Mechanics, optics, acoustics, reinforced concrete; master level. La Rochelle University, France

Education

- 1996 – 1999 **Ph.D., Poitiers University, France** Civil Engineering.
Thesis title: *Experimental study on flow noise reduction using stable paths of bifurcation.*
<https://tel.archives-ouvertes.fr/tel-02166666/document>
- 1995 – 1996 **Postgraduate Degree (DEA), Poitiers University.**
- 1995 **M.Sc. Civil Engineering, Poitiers University.**

Research Publications

Journal Articles (13 in total, 7 as first author)

- 1 Lorino, T., Vandanjon, P. O., PRUAL, J. M., & Coiret, A. (2020). Analyse de trajectoires fluviales à partir de données SIA pour la conception d'une passerelle. *RTS - Recherche Transports Sécurité*, 2020, 7p.
https://doi.org/10.25578/RTS_ISSN1951-6614_2020-03
- 2 Coiret, A., Deljanin, E., & Vandanjon, P.-O. (2020). Vehicle energy savings by optimizing road speed-sectioning. *European Transport Research Review*, 12(41).
<https://doi.org/https://doi.org/10.1186/s12544-020-00432-8>

- 3 **Coiret, A.**, Vandanjon, P.-O., Deljanin, E., Ortiz, M., & Lorino, T. (2020). Management of road speed sectioning to lower vehicle energy consumption. *Transportation Research Procedia*, 45, 724–731.
<https://doi.org/https://doi.org/10.1016/j.trpro.2020.02.105>
- 4 Vandanjon, P.-O., Vinot, E., Cerezo, V., **Coiret, A.**, Dauvergne, M., & Bouteldja, M. (2019). Longitudinal profile optimization for roads within an eco-design framework. *Transportation Research Part D: Transport and Environment*, 67, 642–658.
<https://doi.org/https://doi.org/10.1016/j.trd.2019.01.002>
- 5 **Coiret, A.**, Vandanjon, P.-O., & Montalva, H. (2017). Évaluation de l'adhérence de pneumatiques sur pistes comme un paramètre de la sécurité des métros automatiques. *RTS - Recherche Transports Sécurité*, 2017(01-02), 23–29. <https://hal.archives-ouvertes.fr/hal-01670595>
- 6 Vandanjon, P.-O., **Coiret, A.**, & Lorino, T. (2014). Application of viability theory for road vehicle active safety during cornering manoeuvres. *Vehicle System Dynamics*, 52(2), <https://doi.org/10.1080/00423114.2013.873813>, 244–260.
<https://doi.org/10.1080/00423114.2013.873813>
- 7 **Coiret, A.**, Orfila, O., & Kane, M. (2011). Concept de contrôlabilité : de l'adhérence des chaussées au diagnostic de sécurité sur itinéraire. *Revue générale des routes*, (891), pp 36–40.
<https://hal.archives-ouvertes.fr/hal-00906452>
- 8 Orfila, O., **Coiret, A.**, Do, M.-T., & Mammar, S. (2010). Modeling of dynamic vehicle–road interactions for safety-related road evaluation. *Accident Analysis Prevention*, 42(6), 1736–1743.
<https://doi.org/https://doi.org/10.1016/j.aap.2010.04.014>
- 9 **Coiret, A.**, & Orfila, O. (2008). Concurrent evaluation of the tire/pavement contact torsor by means of both a dynamometer wheel and a road infrastructure-integrated system. *Bulletin des Laboratoires des Ponts et Chaussées*, (273), pp 133–145. <https://hal.archives-ouvertes.fr/hal-00376819>
- 10 **Coiret, A.** (2005a). Modeling the in-lane collision risk induced by variability in skid resistance-based performance. *Bulletin des Laboratoires des Ponts et Chaussées*, (255), pp 181–191.
https://www.researchgate.net/publication/289485419_Modeling_the_in-lane_collision_risk_induced_by_variability_in_skid_resistance-based_performance
- 11 **Coiret, A.** (2005b). Spectroscopic evaluation of pavement wetting states: Influence on wheel/ground friction. *Bulletin des Laboratoires des Ponts et Chaussées*, (255), pp 137–155.
https://www.researchgate.net/publication/344672919_Spectroscopic_evaluation_of_pavement_wetting_states_Influence_on_tireroad_friction
- 12 **Coiret, A.**, Guérin, S., Sakout, A., & Henry, R. (2001). Numerical approach of self-sustained tone generation and reduction in ducts. *Journal of Low Frequency Noise, Vibration and Active Control*, 20(1), n.a. <https://hal.archives-ouvertes.fr/hal-00312189>
- 13 Henry, R., Sakout, A., **Coiret, A.**, & Hamdouni, A. (1998). A new way of reducing self-sustained flow noise. *Journal of the Acoustical Society of America*, 103(5), 2917.
<https://hal.archives-ouvertes.fr/hal-00312228>

Conference Proceedings (33 in total, 16 as first author)

- 1 **Coiret, A.**, Vandanjon, P. O., Deljanin, E., Ortiz, M., & Lorino, T. (2019). Management of road speed sectioning to lower vehicle energy consumption, In *TIS Roma 2019, AIIT 2nd International Congress on Transport Infrastructure and Systems in a changing world*. september 23-24, 2019, Rome, Italy.
<https://hal.archives-ouvertes.fr/hal-02303574>
- 2 Deljanin, E., Vandanjon, P.-O., **Coiret, A.**, & Causevic, S. (2018). Ecodriving potential of roads according to their speed sectioning : Bosnia and France cases, In *5th International Conference on Road and Rail Infrastructure (CETRA 2018)*. may 17-19, 2018, Zadar, Croatia.
<https://hal.archives-ouvertes.fr/hal-02081082>

- 3 **Coiret, A.**, Blanchard, G., Le Denmat, G., & Vandanjon, P.-O. (2018). Initiative Ciblée Cycl'Eval : cyclabilité des itinéraires, In *Journées techniques route jtr2018*. february 7-8, 2018, Nantes, France.
- 4 Vandanjon, P. O., Bosquet, R., **Coiret, A.**, & Gautier, M. (2016). Model of High-Speed train energy consumption, In *15th Mini Conference on Vehicle System Dynamics, Identification and Anomalies (VSDIA 2016)*. november 07-09, 2016, Budapest, Hungary.
<https://hal.archives-ouvertes.fr/hal-02012129>
- 5 **Coiret, A.**, Vandanjon, P.-O., & Cuervo-Tuero, A. (2016). Ecodriving potentiality assessment of road infrastructures according to the adequacy between infrastructure slopes and speeds limits, In *4th International Conference on Road and Rail Infrastructure (CETRA 2016)*. may 22-25, 2016, Sibenik, Croatia.
<https://hal.archives-ouvertes.fr/hal-01326825>
- 6 **Coiret, A.**, Blanchard, G., Le Denmat, G., & Vandanjon, P. O. (2015). Transposability of road management devices to the evaluation of comfort and safety of cycling lanes, In *VELOCITY 2015*. june 02-05, 2015, Nantes, France. <https://hal.archives-ouvertes.fr/hal-01470514>
- 7 Nedonchelle, M., Gerain, F., Le Denmat, G., **Coiret, A.**, Vandanjon, P. O., Prual, J. M., Vidal, L., & Blanchard, G. (2015). Pistes cyclables et innovation dans les marchés publics, In *VELOCITY 2015*. june 02-05, 2015, Nantes, France. <https://hal.archives-ouvertes.fr/hal-01470518>
- 8 Bosquet, R., Vandanjon, P., Gautier, M., **Coiret, A.**, & Cazier, O. (2014). Influence of railway gradient on energy efficiency of high speed train, In *TRA2014 Transport Research Arena 2014 : Transport Solutions: from Research to Deployment*. april 14-17, 2014, Paris, France.
- 9 **Coiret, A.**, Vandanjon, P., Bosquet, R., Soubrié, T., & Baty, G. (2014). Experimental assessment of wind influence on high-speed train energy consumptions, In *TRA2014 Transport Research Arena 2014 : Transport Solutions: from Research to Deployment*. april 14-17, 2014, Paris, France.
- 10 Freitas Salgueiredo, C., Orfila, O., Saint Pierre, G., Glaser, S., **Coiret, A.**, & Vandanjon, P. (2014). Overview of Solutions for Reducing CO2 Emissions during the Use Phase of Passenger Cars, In *TRA2014 Transport Research Arena 2014 : Transport Solutions: from Research to Deployment*. april 14-17, 2014, Paris, France. <https://hal.archives-ouvertes.fr/hal-02193741>
- 11 **Coiret, A.**, Vandanjon, P. O., Bosquet, R., & Jullien, A. (2014). Comparative wind influence on use phase energy consumptions of roads and railways, In *CETRA 2014, 3rd International Conference on Road and Rail Infrastructure*. april 28-30, 2014, Split, Croatia.
- 12 Bosquet, R., Vandanjon, P. O., **Coiret, A.**, & Lorino, T. (2013). Model of high-speed train energy consumption, In *International Conference on Railway Engineering and Management*. june 13-14, 2013, Copenhagen, Denmark. <https://hal.archives-ouvertes.fr/hal-00914588>
- 13 Vandanjon, P. O., **Coiret, A.**, Muresan, B., Fargier, A., Dauvergne, M., Bosquet, R., Jullien, A., Francois, D., & Labarthe, F. (2012). Practical guidelines for Life Cycle Assessment applied to railways project, In *International Symposium Life Cycle Assessment and Construction 2012*. july 10-12, 2012, Nantes, France. <https://hal.archives-ouvertes.fr/hal-00960384>
- 14 **Coiret, A.**, Vandanjon, P. O., Bosquet, R., & Jullien, A. (2012). Energy consumption induced by operation phase of railways and road infrastructures, In *CETRA 2012, 2nd International Conference on Road and Rail Infrastructure*. may 7-9, 2012, Dubrovnik, Croatia.
<https://hal.archives-ouvertes.fr/hal-00850910>
- 15 **Coiret, A.**, Orfila, O., & Kane, M. (2008). Aquaplaning phenomenon characterisation of a rotating tire over water puddles, In *SURF 2008*. october 20-22, 2008, Portoroz, Slovenia.
<https://hal.archives-ouvertes.fr/hal-00399939>
- 16 Orfila, O., & **Coiret, A.** (2008). Experimental evaluation of curves design rules by analyzing vehicle infrastructure interactions, In *SURF 2008*. october 20-22, 2008, Portoroz, Slovenia.
<https://hal.archives-ouvertes.fr/hal-00399957>

- 17 Orfila, O., **Coiret, A.**, & Vandanjon, P.-O. (2008). Road safety contribution by evaluation of tire crushing using a measuring hub, In *Transport Research Arena 2008*. april 21-24, 2008, Ljubljana, Slovenia.
- 18 Orfila, O., Vandanjon, P.-O., & **Coiret, A.** (2008). Contribution of simplified vehicle dynamic models to road safety analysis : Evaluation with reference model and full scale experiments, In *Transport Research Arena 2008*. april 21-24, 2008, Ljubljana, Slovenia.
- 19 **Coiret, A.** (2006a). Evaluation concurrentielle du torseur de contact pneumatique/chaussée au moyen d'une roue dynamométrique et d'un système intégré à l'infrastructure routière, In *4e journées sciences de l'ingénieur - jsiz2006*. december 5-6, 2006, Marne la vallee, France.
- 20 **Coiret, A.** (2006b). Tire/pavement force tensor differential evaluation between dynamometric wheel and infrastructure-based system, In *ASME International Mechanical Engineering Congress and Exposition*. November 5-10, 2006, Chicago, USA.
<https://doi.org/https://doi.org/10.1115/IMECE2006-13255>
- 21 **Coiret, A.**, Gallenne, M.-L., & Hammoum, F. (2005). Measurement feasibility of the strain tensor applied by a light vehicle, from the pavement, In *Journées internationales de tribologie jft 2005*. may 11-13, 2005, Tarbes, France.
- 22 **Coiret, A.**, Gallenne, M.-L., & Texier, P.-Y. (2005). Tire / pavement strain tensor measurement with an infrastructure-based approach, In *World Tribology Congress III*. sept. 12-16, 2005, Washington DC, USA.
- 23 **Coiret, A.**, & Delanne, Y. (2003). Modelisation of accident risks links to the heterogeneity of grouped vehicles, In *Technological innovation for land transportation (tilt2003)*. December 2-4, 2003, Lille, France.
- 24 **Coiret, A.**, & Rakotondrasolo, J.-M. (2003). Estimation de l'influence de l'état hydrique des chaussées sur l'adhérence des pneumatiques, In *Journées sciences de l'ingénieur - jsiz2003*. december 9-11, 2003, Verneuil-sur-Avre, France.
- 25 Delaunay, D., Soubra, S., **Coiret, A.**, Carré, S., & Bouvier, P. (2002). Development of an interactive design tool for the evaluation of pedestrians thermal environment, In *First International Workshop on Architectural and Urban Ambient Environment*. 6-8 February, 2002, Nantes, France.
- 26 **Coiret, A.**, Sakout, A., Guerin, S., & Henry, R. (2000). Numerical approach of self-sustained tones in flow, In *Euromech Fluid Mechanics Conference*. 19-23 november, 2000, Eindhoven, Netherlands.
<https://hal.archives-ouvertes.fr/hal-00312408>
- 27 Guérin, S., **Coiret, A.**, Sakout, A., & Henry, R. (2000). Approche expérimentale d'une bifurcation turbulente réductrice de bruits auto-entretenus, In *5th french congress on acoustics, september 3-6, 2000*, Lausanne, Suisse. <https://hal.archives-ouvertes.fr/hal-00312470>
- 28 Guerin, S., **Coiret, A.**, Sakout, A., & Henry, R. (2000). Self-sustained flow noise reduction using a Coanda effect, In *29th INTERNOISE*, August 27-30, 2000 Nice, France.
<https://hal.archives-ouvertes.fr/hal-00312471>
- 29 Guerin, S., **Coiret, A.**, Sakout, A., & Henry, R. (1999). champ turbulent d'une bifurcation réductrice de nuisances sonores : résultats expérimentaux, In *14e Congrès Français de Mécanique, 30 aout-3 septembre*, Toulouse, France. <https://hal.archives-ouvertes.fr/hal-00312472>
- 30 Henry, R., Sakout, A., & **Coiret, A.** (1998). Flow noise reduction using stable paths of flow bifurcation, In *4th aiaa/ceas aeroacoustics conference, 02-04 june 1998*, Toulouse, France.
<https://doi.org/10.2514/6.1998-2374>
- 31 Sakout, A., **Coiret, A.**, & Henry, R. (1998). Atténuation d'instabilités et réduction du bouclage aéroacoustique par interaction de couches de cisaillement plane et axisymétrique, In *3ème colloque r et t - cnes-onera*. march 1-5, 1998, Poitiers, France.
- 32 Sakout, A., Henry, R., & **Coiret, A.** (1998). A new way of reducing self-sustained flow noise, In *16th international congress on acoustic, acoustical society of america*, Seattle, USA, june 20-26 1998.
<https://hal-univ-rochelle.archives-ouvertes.fr/hal-02449646>

Coïret, A., Sakout, A., & Henry, R. (1997). Approche numérique du phénomène de bruits auto-entretenus par deux diaphragmes dans un écoulement, In *13ème congrès français de mécanique*. September 1-5, 1997, Poitiers, France.

Publication administration

- 2020 – **Editorial Board membership:** *International Journal of Transportation Engineering and Technology, NYC, USA.* <http://www.ijtet.org/>
- 2020 **Journal Peer Reviewer:** *Springer Nature Applied Sciences*
- 2014 **Journal Peer Reviewer:** *Research in Transportation Business & Management*
- 2007 **Journal Peer Reviewer:** *Optics and Lasers in Engineering*

Student supervision

- 2003: Postgraduate Degree (DEA) **JaoNasy Michel Rakotondrasolo**, "Impact de l'état hydrique des chaussées sur l'adhérence des véhicules équipés de pneumatiques"; defense: july 10, 2003; manuscript 74 pages, Nantes University, France.
- 2006 – 2009, Ph.D. Thesis **Olivier Orfila**, "Influence de l'infrastructure routière sur l'occurrence des pertes de contrôle de véhicules légers : modélisation et validation sur site expérimental" (supervision rate 50%), defense: october 12, 2009, Evry University, France.
<https://www.biblio.univ-evry.fr/theses/2009/2009EVRY0014.pdf>
- 2013, engineer degree **Kun Yang**, "Identification de tronçons homogènes sur un parcours acquis par GPS et centrale inertielle" (supervision rate 30 %), defense: september 2013, Ecole des Mines engineering school, Nantes, France.
- 2013, M.Sc. degree **Freddy Toyman**, "Impact de la géométrie des routes sur les consommations d'énergie des véhicules" (supervision rate 70 %), defense: september 2013, Le Havre University, France.
- 2015, M.Sc. degree **Ana Cuervo-Tuero**, "Potentiel d'éco-conduite des infrastructures routières" (supervision rate 80 %), defense: september 2013, Ecole des Mines, Albi, France.
- 2012, engineer degree **Amira Tlija**, "Modélisation de l'énergie liée à la phase d'usage des infrastructures routières et de leur trafic" (supervision rate 40 %), defense: september 14, 2012, ESSAI engineering school, Tunis, Tunisia.

Student supervision (continued)

- 2011 – 2015, Ph.D. Thesis **Romain Bosquet**, "Modélisation énergétique de l'usage des infrastructures ferroviaires selon leurs caractéristiques, tracé et vitesses d'exploitation" » (supervision rate 30%), defense: june 23, 2015, Nantes University, France.
<http://archive.bu.univ-nantes.fr/pollux/fichiers/download/65cbb2fc-df86-4666-be93-62f8c11308c6>
- 2016 – 2019, Ph.D. Thesis **Emir Deljanin**, "Eco-driving potentiality of road infrastructures according to the adequacy between infrastructure geometrical characteristics and vehicles speed" (manuscript in english, supervision rate 50%), defense: september 20, 2019, Nantes University, France and Sarajevo University, Bosnia-Herzegovina (co-supervision).
<http://archive.bu.univ-nantes.fr/pollux/fichiers/download/7b30e491-1115-4e4b-8aeb-c2219c2def2a>
- 2018 – , Ph.D. Thesis **Martin Fontaine**, "Étude théorique et expérimentale pour le développement d'un système de pesage embarqué dans un pneu" (supervision rate 30%), Nantes University, France.

Research administration

- 2006 – 2009 **Administration of a large research project:** "Controlability" Research, about road/driver/vehicle controlability. Research administrated over 4 years; organisation of 13 meetings and 2 plenary seminars (about 100 attendees, feb. 2008 and sept. 2010).
2006 budget: 524k€, including human ressources (204 men-months).
2007 budget: 637k€, including human ressources (51 men-months).
2008 budget: 2281k€, including human ressources (188 men-months).
2009 budget: 1835k€, including human ressources (157 men-months).
131 productions, whose: 6 Ph.D. thesis supervision, 14 journal articles, 29 conferences communications, and reports, and equipment and software developments.
- 2011 – 2015 **Administration of half of a research project:** Collaboration project between my laboratory and RFF (French railway network). Global budget of 400k€, including a Ph.D. funding. Productions: full-scale experimentation with high-speed trains; train energy model; Ph.D. manuscript, journal articles, communications and technical reports.

Research contributions

- 2011 – 2015 **SARI-IRCAD, French national project (PCRD):** Contribution, National research project, budget of 2194 k€, vehicle to infrastructure communication, author of the technical report: "Glaser S., Mammari S., Coiret A., Dufresne M., Modèle Paramétrique et Domaines de Stabilité, SARI-IRCAD project, WBS 1.7.1., may 2006, 42 pages".
http://sari.ifsttar.fr/livrables/ircad/IRCAD_1.7.1.pdf
- SARI-RADDAR national project:** Contribution, French National research project (PCRD), budget of 3498 k€, vehicle handling, author of the technical report: "Coiret Alex, Représentativité de mesures dynamométriques liées à l'infrastructure vis-à-vis de mesures dynamométriques embarquées, SARI-RADARR project, may 2006, 46 pages".
http://sari.ifsttar.fr/livrables/radarr/RADARR_3.1.2.pdf

Research contributions (continued)

- **ROSE project, Denmark, "ROads Saving Energy":** Collaboration on a Danish project. "The objective of ROSE is to reduce the vehicle rolling resistance by 20% compared to the average level for present Danish road pavements". Partners: two universities (RUC, DTU), the Danish and French government road-research organizations (VD, IFSTTAR), and five private companies (NCC Roads A/S, Greenwood Engineering A/S, Continental AG, Total Bitumen, AfterMath). Total budget: 4 M€. Ifsttar budget: 335 k€. My contribution: article draft and submission: "influence of crossfall on vehicle consumption".
- **Nova-TP regional project:** bicycle lanes. Partners: Nantes-Métropole (city), Ifsttar (me and 3 colleagues), SCE / Keran, Eiffage, Charier TP, Novabuild. My contribution: Two technical reports (grip measurement of bicycle lanes, structures of lanes), two communications to the international conference VELOCITY2015 (Nantes, France).

Expertise

- 2013 – 2015 ■ **Autonomous Metro of Toulouse city, France,** Expertise Management and contribution. Customer: TISSEO, metro network operator of the Toulouse city (France). Duration: 36 months, Budget 38,5k€. Personal tasks: Administration, Participation to the writing of 6 out of the 10 technical reports delivered to the customer, First author of a journal article (RTS, Coiret 2017 in publication list), full-scale experiments: 3 missions.
- 2017 ■ **Rouen Metropole, France** Boat trajectories expertises prior to the building of a light bridge. Budget: 11700 €, duration of 8 weeks. Personal tasks: data analysis (matlab, R), final report contribution (32 pages), author of a journal article (8 pages, RTS journal, Lorino 2020 in publication list).

Fields of competence

Experimentations	road pavement instrumentation (deformations, contact forces), vehicle instrumentation (GPS, wheel forces measurements, optical sensors Aquasens or correvit, laser).
Data analysis	Matlab/simulink, Scilab, R
Numerical Modeling	Fluid dynamics (Fluent), vehicle dynamics (Carmaker, Callas),
Programing	C++, R, bash, python