

THOMAS GERNAY

Assistant Professor

Department of Civil and Systems Engineering, Johns Hopkins University

3400 N Charles Street, Latrobe Hall 211, Baltimore, MD 21218

+1 (410) 516 9884 / tgernay@jhu.edu

PROFESSIONAL

Johns Hopkins University, Baltimore, MD, U.S.A. Assistant Professor	1/2018 – present
University of Liege, Belgium Adjunct Lecturer	9/2016 – 12/2017
Postdoctoral Researcher - F.R.S.-FNRS Fellowship	9/2015 – 12/2017
Princeton University, Princeton, NJ, U.S.A. Postdoctoral Researcher - Fulbright and BAEF Fellowships	9/2014 – 8/2015
Cockerill Maintenance et Ingénierie (CMI), Liege, Belgium Project Engineer	4/2013 – 5/2014
Commissariat à l'Energie Atomique (CEA), Saclay, France Visiting Scholar – Camille Hela Fellowship	9/2010 – 2/2011
University of Liege, Belgium Doctoral Researcher - F.R.S.-FNRS Fellowship	10/2009 – 3/2013

EDUCATION

Doctorate (Ph.D.) Degree: Structural Engineering , University of Liege, Belgium	2012
Master Degree: Civil Engineering , University of Liege, Belgium	2009
Erasmus , Universidad Politécnica de Madrid, E.T.S.I. C.C.P., Spain	2007-2008
Bachelor Degree: Engineering Sciences , University of Liege, Belgium	2007

HONORS

Awards

Foundation Medal, NFPA Fire Protection Research Foundation	2019
Literati Award for Outstanding Paper, Emerald Publishing	2019
International Gustave Magnel Award, SECO	2017
Prix des Amis de l'ULg "Prix Président André Leroux"	2017
IAFSS Best Thesis Award 'Excellence in Research'	2014
McKinsey & Company Scientific Award	2013
AILg Young Scientist Award	2013
PIANC De Paepe-Willems Award	2010
SOFICO Best Master's Thesis Award	2009

Fellowships

Belgian National Fund for Scientific Research F.R.S.-FNRS, 3-year postdoctoral fellowship	2014
Fulbright Commission, 1-year postdoctoral fellowship	2014
Belgian American Educational Foundation B.A.E.F., 1-year postdoctoral fellowship	2014
Camille Hela Foundation, visiting scholar fellowship	2010
Belgian National Fund for Scientific Research F.R.S.-FNRS, 4-year doctoral fellowship	2009
Pisart Foundation Language Grant	2009
Pisart Foundation Mobility Study Grant	2008

RESEARCH AREAS

- Structural Fire Engineering
- Computational Mechanics
- Concrete Structures
- Fire Safety Engineering
- Finite Element Modeling
- Steel Structures
- Performance-Based Design
- Structural Reliability
- Community Resilience

RESEARCH GRANTS

Awarded

ArcelorMittal Global R&D (PI)	2020
ACI American Concrete Institute Foundation CRC (PI)	2020
World Steel Association (PI)	2019
HEMI Seed Grant (PI)	2019
CERIB Center for Research of Concrete Industry (PI)	2019
NFPA Fire Protection Research Foundation (co-PI)	2019
ASCE SEI and CPF (co-PI)	2018

Submitted proposals

NSF – HDBE Program (PI)	2020
NSF – ECI Program (PI)	2020
AISC – MILEK (PI)	2019
NIST – Disaster Resilience Program (co-PI)	2018
NIST – Disaster Resilience Program (co-PI)	2018
NIST – Disaster Resilience Program (PI)	2018
NSF – HDBE Program (PI)	2018

SOFTWARE

SAFIR[®] (2012-present): Continuously co-develop and maintain **SAFIR**[®], a nonlinear finite element software for the simulation of the behavior of building structures subject to fire. **SAFIR** has +250 licensees among universities, research centers and design offices worldwide, and +750 demonstration versions distributed for education or research purposes. The software has been used for the fire design of actual structures, including buildings, train stations and stadiums. Short courses on **SAFIR** have been conducted for structural engineers and academics in Europe and in the USA. (<https://mars.jhu.edu/safir/>)

PEER-REVIEWED JOURNAL ARTICLES

A full list is available on [Google Scholar](#). The five most representative publications are **highlighted in bold**.

42. Yan X., Xia Y., Blum HB., & **Gernay T.** (2020). "Elevated temperature material properties of advanced high strength steel alloys". *Journal of Constructional Steel Research*, 174, 106299.
41. Batista Abreu JC., Vieira Jr LCM., Moreno Jr A.L., **Gernay T.**, & Schafer BW. (2020). "Experiments on load-bearing cold-formed steel sheathed studs at elevated temperatures". *Thin-Walled Structures*, 156, 106968.
40. Jovanović B., Van Coile R., Hopkin D., Elhami Khorasani N., Lange D., & **Gernay T.** (2020) "Review of Current Practice in Probabilistic Structural Fire Engineering: Permanent and Live Load Modelling". *Fire Technology*, <https://doi.org/10.1007/s10694-020-01005-w>
39. Ni S., & **Gernay T.** (2020). "Considerations on computational modeling of concrete structures in fire". *Fire Safety Journal*, 103065.

38. Elhami Khorasani N., Salado Castillo J.G., Saula E., Josephs T., Nurlybekova G., & Gernay T. (2020). "Application of a digitized fuel load surveying methodology to office buildings". *Fire Technology*, <https://doi.org/10.1007/s10694-020-00990-2>.
37. Elhami Khorasani N., Salado Castillo J.G., & Gernay T. (2020). "A digitized fuel load surveying methodology using machine vision". *Fire Technology*, <https://doi.org/10.1007/s10694-020-00989-9>.
36. Gernay T., & Franssen J.-M. (2020). "The introduction and the influence of semi-rigid connections in framed structures subjected to fire". *Fire Safety Journal*, 114, 103007.
35. Van Coile R., Hopkin D., Elhami Khorasani N., & Gernay T. (2020). "Demonstrating adequate safety for a concrete column exposed to fire using probabilistic methods". *Fire and Materials*, 10.1002/fam.2835.
34. Qureshi R., Ni S., Elhami Khorasani N., Van Coile R., Hopkin D., & Gernay T. (2020). "Probabilistic models for temperature-dependent strength of steel and concrete". *Journal of Structural Engineering ASCE*, 146(6): 04020102.
- 33. Gernay T., & Elhami Khorasani N. (2020). "Recommendations for performance-based fire design of composite steel buildings using computational analysis". *Journal of Constructional Steel Research*, 166, 105906.**
32. LaMalva K., Bisby L., Gales J., Gernay T., Hantouche E., Jones C., Morovat A., Solomon R., & Torero J. (2020). "Rectification of restrained vs unrestrained". *Fire and Materials*, 44, 341-351.
31. Ni S., & Gernay T. (2020). "Predicting residual deformations in a reinforced concrete building structure after a fire event". *Engineering Structures*, 202, 109853.
30. Qureshi R., Elhami Khorasani N., & Gernay T. (2019). "Adaption of active boundary conditions in structural fire testing". *Journal of Structural Fire Engineering*, 10(4), 504-528.
29. Achenbach M., Gernay T., & Morgenthal G. (2019). "Quantification of model uncertainties for reinforced concrete columns subjected to fire". *Fire Safety Journal*, 108, 102832.
28. Maraveas C., Gernay T., Franssen J.-M. (2019). "An equivalent stress method to account for local buckling in beam finite elements subjected to fire". *Journal of Structural Fire Engineering*, 10(3), 340-353.
27. Mergny E., Gernay T., Drion G., & Franssen J.-M. (2019). "Hybrid fire testing in a non-linear environment using a proportional integral controller". *Journal of Structural Fire Engineering*, 10(2), 245-258.
- 26. Gernay T. (2019). "Fire resistance and burnout resistance of reinforced concrete columns". *Fire Safety Journal*, 104, 67-78. Editor-in-Chief's Featured Article March issue.**
25. Gernay T., Van Coile R., Elhami Khorasani N., & Hopkin D. (2019). "Efficient uncertainty quantification method applied to structural fire engineering computations". *Engineering Structures*, 183, 1-17.
24. Elhami Khorasani, N., Gernay, T., & Fang, C. (2019). Parametric study for performance-based fire design of U.S. prototype composite floor systems. *Journal of Structural Engineering ASCE*, 145(5): 04019030.
23. Gernay, T., Elhami Khorasani, N., & Garlock, M. (2019). Fire fragility functions for steel frame buildings: Sensitivity analysis and reliability framework. *Fire Technology*, 55(4), 1175-1210.
22. Gernay, T., & Gamba, A. (2018). Progressive collapse triggered by fire-induced column loss: Detrimental effect of thermal forces. *Engineering Structures*, 172, 483-496.
21. Sauca, A., Gernay, T., Tondini, N., Robert, F., & Franssen, J.-M. (2018). Hybrid Fire Testing: Discussion on stability and implementation of a new method in a virtual environment. *Journal of Structural Fire Engineering*, 9(4), 319-341. Emerald Literati Award for Outstanding Paper.
20. Elhami Khorasani, N., Gernay, T., & Garlock, M. (2017). Data-Driven Probabilistic Post-Earthquake Fire Ignition Model for a Community. *Fire Safety Journal*, 94, 33-44.
19. Molken, T., Van Coile, R., & Gernay, T. (2017). Assessment of damage and residual load bearing capacity of a concrete slab after fire: Applied reliability-based methodology. *Engineering Structures*, 150, 969-985.
- 18. Franssen, J.-M., & Gernay, T. (2017). Modeling structures in fire with SAFIR®: Theoretical background and capabilities. *Journal of Structural Fire Engineering*, 8(3), 300-323.**
17. Gernay, T. (2016). A method for measuring the sensitivity of building structural members to fire decay phases. *Acta Polytechnica*, 56(4), 344-352.

16. Gernay, T. (2016). Fire performance of columns made of normal and high strength concrete: A comparative analysis. *Key Engineering Materials*, 711, 564-571.
15. Franssen, J.-M., Zhao, B., & Gernay, T. (2016). Experimental Tests and Numerical Modelling on Slender Steel Columns at High Temperatures. *Journal of Structural Fire Engineering*, 7(1), 30-40.
14. **Gernay, T., Elhami Khorasani, N., & Garlock, M. (2016). Fire Fragility Curves for Steel Buildings in a Community Context: A Methodology. *Engineering Structures*, 113, 259-276.**
13. Chu, T.B., Gernay, T., Dotreppe, J.-C., & Franssen, J.-M. (2016). Steel hollow columns with an internal profile filled with self-compacting concrete under fire conditions. *Proceedings of the Romanian Academy. Series A, Mathematics, Physics, Technical Sciences, Information Science*, 17(2), 152-159.
12. Dumont, F, Wellens, E, Gernay, T. & Franssen, J.-M. (2016). Loadbearing capacity criteria in fire resistance testing. *Materials and Structures*, 49, 4565-4581.
11. Gernay, T. & Franssen, J.-M. (2015). A Performance Indicator for Structures under Natural Fire. *Engineering Structures*, 100, 94-103.
10. Gernay, T. & Franssen, J.-M. (2015). A plastic-damage model for concrete in fire: Applications in structural fire engineering. *Fire Safety Journal*, 71, 268-278.
9. **Gernay, T., Millard, A., & Franssen, J.-M. (2013). A multiaxial constitutive model for concrete in the fire situation: Theoretical formulation. *International Journal of Solids and Structures*, 50(22-23), 3659-3673.**
8. Zaharia, R, Vulcu, C, Vassart, O, Gernay, T. & Franssen, J.-M. (2013). Numerical analysis of partially fire protected composite slabs. *Steel and Composite Structures*, 14(1), 21-39. DOI: 10.12989/scs.2013.14.1.021
7. Gernay, T. & Dimia, M.S. (2013). Structural Behaviour of Concrete Columns under Natural Fires. *Engineering Computations*, 30(6), 854 – 872.
6. Gernay, T. & Franssen, J.-M. (2012). A formulation of the Eurocode 2 concrete model at elevated temperature that includes an explicit term for transient creep. *Fire Safety Journal*, 51, 1-9.
5. Vassart, O, Bailey, C. G, Hawes, M, Nadjai, A, Simms, W. I, Zhao, B, Gernay, T. & Franssen, J.-M. (2012). Large-scale fire test of unprotected cellular beam acting in membrane action. *Proceedings of the Institution of Civil Engineers: Structures and Buildings*, 165(7), 327–334.
4. Gernay, T. (2012). Effect of Transient Creep Strain Model on the Behavior of Concrete Columns Subjected to Heating and Cooling. *Fire Technology*, 48(2), 313-329.
3. Dimia, M. S, Guenfoud, M, Gernay, T. & Franssen, J.-M. (2011). Collapse of concrete columns during and after the cooling phase of a fire. *Journal of Fire Protection Engineering*, 21(4), 245–263.
2. Gernay, T. & Rigo, P. (2010). Analysis of ship impact on lock gates - Seine-Escaut Est waterway. *Mathematical Modelling in Civil Engineering*, 6(4), 43-55.
1. Gernay, T. (2010). Optimization and analysis of lock gates in the framework of the "Seine-Escaut Est" waterway upgrading. *Bulletin of the Permanent International Association of Navigation Congresses*, (141), 11-26.

BOOK CHAPTERS

5. Gernay, T., Kodur, V., Naser, M.Z., Imani, R., & Bisby, L. (submitted). Concrete structures. In La Malva, K., & Hopkin, D. (Eds.), *The Structural Fire Engineering Handbook* (1st ed). Springer.
4. Gernay, T., & Kotsovinos, P. (submitted). Advanced analysis of structures in fire. In La Malva, K., & Hopkin, D. (Eds.), *The Structural Fire Engineering Handbook* (1st ed). Springer.
3. Gernay, T., & Elhami Khorasani, N. (2019). Resilience of the built environment to fire and fire-following-earthquake. In Farsangi, E.N., Takewaki, I., Yang, T.Y., Astaneh-Asl, A., & Gardoni, P. (Eds.), *Resilient Structures and Infrastructure* (1st ed). Springer Nature Singapore Pte Ltd., ISBN: 978-981-13-7445-6, DOI: 10.1007/978-981-13-7446-3_16.

2. Franssen, J.-M., & Gernay, T. (2013). Resistencia al fuego de armaduras de acero inoxidable. In D. M., Bastidas & E., Medina Sanchez (Eds.), *Armaduras de Acero Inoxidable* (1st ed, pp. 149-166). Madrid, Spain: CEDINOX.
1. Gernay, T. (2011). Nonlinear numerical analysis of ship impact on lock gates. In Van Schel, L (Ed.), *PIANC Yearbook 2010* (pp. 117-121). Brussels, Belgium: PIANC.

ARTICLES IN CONFERENCE PROCEEDINGS

53. Yan, X., Xia, Y., Blum, H.B., & Gernay, T. (2020). Experimental study on the high temperature properties of advanced high-strength cold-formed steels. *Proceedings of the Cold-Formed Steel Research Consortium Colloquium* (cfsrc.org), Oct 20-22.
52. Xia, Y., Yan, X., Gernay, T., & Blum, H.B. (2020). Modeling of stress-strain relationship of advanced high-strength cold-formed steel at elevated temperature. *Proceedings of the Cold-Formed Steel Research Consortium Colloquium* (cfsrc.org), Oct 20-22.
51. Yan, X., Batista Abreu, J.C., Glauz, R.S., Schafer, B.W., & Gernay, T. (2020). Cold-formed steel properties at elevated temperature: Review and proposed equation. *Proceedings of the Cold-Formed Steel Research Consortium Colloquium* (cfsrc.org), Oct 20-22.
50. Van Coile, R., Gernay, T., Hopkin, D., & Elhami Khorasani, N. (2019). Resilience targets for structural fire design: An exploratory study. *17th International Probabilistic Workshop*. Edinburgh, UK, Sep 11-13.
49. Ni, S., Van Coile, R., Hopkin, D., Elhami Khorasani, N., & Gernay, T. (2019). Sensitivity studies of the resilience of RC columns to various fire scenarios. *20th IABSE Congress NYC: The Evolving Metropolis* (pp. 733-737). New York, Sep 4-6.
48. Gernay, T., & Elhami Khorasani, N. (2019). Demonstrating performance-based fire design of composite buildings. *20th IABSE Congress NYC: The Evolving Metropolis* (pp. 339-343). New York, Sep 4-6.
47. Van Coile, R., Hopkin, D., Elhami Khorasani, N., Lange, D., & Gernay, T. (2019). Permanent and live load model for probabilistic structural fire analysis: A review. *3rd Int. Conf. on Structural Safety under Fire and Blast Loading (Proc. of CONFAB 2019)*. London, UK, Sep 2-4.
46. Van Coile, R., Hopkin, D., Elhami Khorasani, N., & Gernay, T. (2019). Demonstrating adequate safety for a concrete column exposed to fire, using probabilistic methods. *15th Int. Conf. and Exhibition on Fire Science and Engineering. (Proc. of Interflam 2019)*. London, U.K., Jul 1-3.
45. Hopkin, D., Fu, I., Gernay, T., Elhami Khorasani, N., & Van Coile, R.. (2019). The MaxEnt method for probabilistic structural fire engineering – Performance for multi-modal outputs. *15th Int. Conf. and Exhibition on Fire Science and Engineering. (Proc. of Interflam 2019)*. London, U.K., Jul 1-3.
44. Van Coile, R., Gernay, T., Elhami Khorasani, N., & Hopkin, D. (2019). Exploratory study into a safety format for composite columns exposed to fire. *Applications of Structural Fire Engineering Conf. (Proc. of ASFE 2019)*. Singapore, Jun 13-14.
43. Qureshi, R., Ni, S., Elhami Khorasani, N., Van Coile, R., Hopkin, D., & Gernay, T. (2019). Effect of probabilistic strength retention factors for steel and concrete on structural reliability of columns in fire. *3rd Int. Fire Safety Symposium (Proc. of IFireSS 2019)* (pp. 119-126). Ottawa, Canada, Jun 5-7.
42. Gernay, T. (2019). Defining a burnout resistance rating to compare structural components under real fires. *3rd Int. Fire Safety Symposium (Proc. of IFireSS 2019)* (pp. 66-73). Ottawa, Canada, Jun 5-7.
41. Stephani, A., Van Coile, R., Elhami Khorasani, N., Gernay, T., & Hopkin, D. (2018). Probabilistic model for steel yield strength retention factor at elevated temperatures: Influence of model choice on structural failure fragility curve for steel columns exposed to fire. *16th International Probabilistic Workshop (IPW)*. Vienna, Austria, Sep 12-14.
40. Van Coile, R., Gernay, T., Elhami Khorasani, N., & Hopkin, D. (2018). Evaluating uncertainty in steel-composite structure response under fire – Application of the ME-MDRM. *Structures in Fire (Proc. of the 10th Int. Conf.)* (pp. 893-900). Ulster University, UK, Jun 6-8.
39. Gernay, T., & Gamba, A. (2018). Behaviour of steel frame structures under localised fire including progressive collapse during cooling. *Structures in Fire (Proc. of the 10th Int. Conf.)* (pp. 633-640). Ulster University, UK, Jun 6-8.

38. Achenbach, M., Gernay, T., & Morgenthal, G. (2018). Verification of a tabulated method of Eurocode for concrete columns using a response surface and advanced methods. *Structures in Fire (Proc. of the 10th Int. Conf.)* (pp. 101-106). Ulster University, UK, Jun 6-8.
37. Mergny, E., Drion, G., Gernay, T., & Franssen, J.M. (2018). A PI-controller for Hybrid Fire Testing in a non-linear environment. *Structures in Fire (Proc. of the 10th Int. Conf.)* (pp. 861-868). Ulster University, UK, Jun 6-8.
36. Maraveas, C., Gernay, T., & Franssen, J.M. (2018). An equivalent stress method for considering local buckling in beam finite elements in the fire situation. *Structures in Fire (Proc. of the 10th Int. Conf.)* (pp. 703-710). Ulster University, UK, Jun 6-8.
35. Ferreira, J., Gernay, T., & Franssen, J.M. (2018). Discussion on a systematic approach to validation of software for structures in fire. *Structures in Fire (Proc. of the 10th Int. Conf.)* (pp. 317-324). Ulster University, UK, Jun 6-8.
34. Elhami Khorasani, N., Fang, C., & Gernay, T. (2017). Performance-based fire design and the U.S. prescriptive guidelines: A comparative study. *39th IABSE Symposium – Engineering the Future (Proc. of 39th IABSE)* (pp. 3377-3383). Vancouver, Canada, Sep 21-23.
33. Maraveas, C., Gernay, T., & Franssen, J.M. (2017). Buckling of steel plates at elevated temperature: Theory of perfect plates vs finite element analysis. *2nd Int. Conf. on Structural Safety under Fire and Blast Loading (Proc. of CONFAB 2017)*. London, U.K., Sep 10-12.
32. Sauca, A., Mergny, E., Gernay, T., & Franssen, J.M. (2017). A method for hybrid fire testing: development, implementation and numerical application. *Applications of Structural Fire Engineering Conf. (Proc. of ASFE 2017)* (pp. 225-234). Manchester, U.K., Sep 7-8.
31. Gernay, T., Peric, V., Mihaylov, B., Molkens, T., & Franssen, J.M. (2017). Effect of upgrading concrete strength class on fire performance of reinforced concrete columns. *Applications of Structural Fire Engineering Conf. (Proc. of ASFE 2017)* (pp. 189-198). Manchester, U.K., Sep 7-8.
30. Maraveas, C., Gernay, T., & Franssen, J.M. (2017). Sensitivity of elevated temperature load carrying capacity of thin-walled steel members to local imperfections. *Applications of Structural Fire Engineering Conf. (Proc. of ASFE 2017)* (pp. 19-29). Manchester, U.K., Sep 7-8.
29. Elhami Khorasani, N., Fang, C., & Gernay, T. (2017). Comparative fire analysis of steel-concrete composite buildings designed following performance-based and U.S. prescriptive approach. *Applications of Structural Fire Engineering Conf. (Proc. of ASFE 2017)* (pp. 131-140). Manchester, U.K., Sep 7-8.
28. Molkens, T., Gernay, T., & Caspeele, R. (2017). Fire resistance of concrete slabs acting in compressive membrane action. *2nd Int. Fire Safety Symposium (Proc. of IFireSS 2017)* (pp. 661-668). Naples, Italy, Jun 7-9.
27. Gernay, T., Elhami Khorasani, N., & Garlock, M. (2017). Fire risk assessment of multi-story buildings based on fragility analysis. *2nd Int. Fire Safety Symposium (Proc. of IFireSS 2017)* (pp. 25-32). Naples, Italy, Jun 7-9.
26. Elhami Khorasani, N., Gernay, T., & Garlock, M. (2016). Probabilistic Measures of Earthquake Effects on Fire Performance of Tall Buildings. *SEMC (Proc. of the Sixth Int. Conf. on Structural Engineering, Mechanics and Computation.)* (pp. 1744-1749). Cape Town, South Africa, Sep 5-7.
25. Sauca, A., Gernay, T., Robert, F., Tondini, N., & Franssen, J.-M. (2016). A Novel Methodology for Hybrid Fire Testing. *Proc. of the 6th European Conf. on Structural Control* (10 p.). Sheffield, UK, Jul 11-13.
24. Gernay, T., Selamet, S., Tondini, N., & Elhami Khorasani, N. (2016). Urban infrastructure resilience to fire disaster: An overview. *Procedia Engineering (Elsevier)*, 161C, 1801-1805. WMCAUS, Prague, Czech Republic, Jun 13-17.
23. Molkens, T., Gernay, T., & Van Coile, R. (2016). Conversion of visual post fire measurements into fire severity with the aid of thermo-plastic analysis for retrofitting. *Structures in Fire (Proc. of the 9th Int. Conf.)* (pp. 893-900). Princeton, NJ, USA, Jun 8-10.
22. Achenbach, M., Gernay, T., & Morgenthal, G. (2016). Fire Resistance of Reinforced Concrete Columns Subjected to Standard Fire – Comparison of an Advanced and a Simplified Method. *Structures in Fire (Proc. of the 9th Int. Conf.)* (pp. 86-93). Princeton, NJ, USA, Jun 8-10.
21. Elhami Khorasani, N., Gernay, T., & Garlock, M. (2016). Fire fragility functions for community resilience

- assessment. *Structures in Fire (Proc. of the 9th Int. Conf.)* (pp. 909-916). Princeton, NJ, Jun 8-10.
20. Gernay, T., Elhami Khorasani, N., & Garlock, M. (2016). Critical parameters in deriving fire fragility functions for steel gravity frames. *Structures in Fire (Proc. of the 9th Int. Conf.)* (pp. 917-924). Princeton, NJ, USA, Jun 8-10.
 19. Gernay, T., & Franssen, J.-M. (2016). Towards a standard measure of the ability of a structure to resist a natural fire. *Structures in Fire (Proc. of the 9th Int. Conf.)* (pp. 861-868). Princeton, NJ, Jun 8-10.
 18. Sauca, A., Gernay, T., Robert, F., Tondini, N., & Franssen, J.-M. (2016). Stability in Hybrid Fire Testing. *Structures in Fire (Proc. of the 9th Int. Conf.)* (pp. 836-843). Princeton, NJ, USA, Jun 8-10.
 17. Gernay, T. (2015). Sensitivity of structures to fire decay phases: quantitative comparison of structural components made of different materials. *Proc. of Int. Conf. ASFE* (pp. 74-79). Dubrovnik, Croatia, Oct 15-16.
 16. Sauca, A., Gernay, T., Robert, F., & Franssen, J.-M. (2015). Analysis of a concrete building exposed to natural fire. *Proc. Int. Conf. ASFE* (pp. 92-97). Dubrovnik, Croatia, Oct 15-16.
 15. Elhami Khorasani, N., Gernay, T., & Garlock, M. (2015). Tools for Measuring a City's Resilience in a Fire Following Earthquake Scenario. *Proc. IABSE Conference - Structural Engineering: Providing solutions to global challenges* (pp. 886-889). Geneva, Switzerland, Sep 23-25.
 14. Gernay, T., Elhami Khorasani, N., & Garlock, M. (2015). Fragility Analysis of a Steel Building in Fire. In A., Usmani, Y., Lu, & P., Das (Eds.), *Proc. of the First Int. Conf. on Structural Safety under Fire & Blast - CONFAB 2015* (pp. 252-261). Glasgow, UK, Sep 2-4.
 13. Franssen, J.-M., Zhao, B., & Gernay, T. (2014). Experimental tests and numerical modelling on eight slender steel columns under increasing temperatures. *Proceedings of the 8th Int. Conf. on Structures in Fire* (pp. 19-24). Shanghai, China, Jun 11-13.
 12. Franssen, J.-M., Cowez, B., & Gernay, T. (2014). Effective stress method to be used in beam finite elements to take local instabilities into account. *Proceedings of the 11th IAFSS Symposium* (pp. 544-557). Christchurch, New Zealand, Feb 10-14.
 11. Gernay, T., & Franssen, J.-M. (2013). A multiaxial constitutive model for concrete in the fire situation. *Proc. of the 13th Fire and Materials Conference* (pp. 149-161). London, UK: Interscience Communications Ltd. San Francisco, USA, Jan 28-30.
 10. Zaharia, R., & Gernay, T. (2012). Validation of the Advanced Calculation Model SAFIR Through DIN EN 1991-1-2 Procedure. *Proceedings of the 10th International Conference ASCCS 2012* (pp. 841-848). Singapore, Jul 2-4.
 9. Gernay, T., & Millard, A. (2012). A multiaxial concrete model for applications in structural fire engineering. In M., Fontana, A., Frangi, & M., Knobloch (Eds.), *Proc. of the 7th Int. Conf. on Structures in Fire* (pp. 531-540). ETH Zurich, Switzerland, Jun 6-8.
 8. Gernay, T., & Dimia, M. S. (2011). Structural Behavior of Concrete Columns under Natural Fires including Cooling Down Phase. In H., Barros, R., Faria, C., Pina, & C., Ferreira (Eds.), *Proc. of the Int. Conf. on Recent Advances in Nonlinear Models - Structural Concrete Applications* (pp. 637-656). Coimbra, Portugal, Nov 24-25.
 7. Zaharia, R., Duma, D. M., Vassart, O., Gernay, T., & Franssen, J.-M. (2011). Simplified Fire Design for Slim Floor Beams. In L., Dunai (Ed.), *Proc. of 6th European Conf. on Steel and Composite Structures* (pp. 1539-1544). Brussels, Belgium: ECCS European Convention for Constructional Steelwork, Budapest, Hungary, Aug 31-Sep 2.
 6. Zaharia, R., Duma, D. M., Vassart, O., Gernay, T., & Franssen, J.-M. (2011). Simplified method for the temperature distribution in slim floor beams. In F., Wald, K., Horova, & J., Jirku (Eds.), *Proc. of Int. Conf. Applications of Structural Fire Engineering* (pp. 11-22). Print Prazska technika, Prague, Czech Republic, Apr 29-30.
 5. Gernay, T., & Franssen, J.-M. (2011). A Comparison Between Explicit and Implicit Modelling of Transient Creep Strain in Concrete Uniaxial Constitutive Relationships. *Proc. of the 12th Fire and Materials Conference* (pp. 405-416). London, UK: Interscience Communications Ltd, San Francisco, USA, Jan 31-Feb 2.

4. Gernay, T., & Franssen, J.-M. (2010). Consideration of Transient Creep in the Eurocode Constitutive Model for Concrete in the Fire situation. In V., Kodur & J.-M., Franssen (Eds.), *Proc. of 6th Int. Conf. Structures in Fire* (pp. 784-791). Lancaster, PA, USA: DEStech Publications, Inc, Michigan State University, USA, Jun 2-4.
3. Vassart, O, Bailey, C. G, Hawes, M, Nadjai, A, Simms, W. I, Zhao, B, Gernay, T., & Franssen, J.-M. (2010). Large-scale fire test of unprotected cellular beam acting in membrane action. In J.-M., Franssen & V., Kodur (Ed.), *Proc. of the 6th Int. Conf. Structures in Fire* (pp. 398-406). Lancaster, PA, USA: DEStech Publications, Inc, Michigan State University, USA, Jun 2-4.
2. Vulcu, C, Gernay, T., Zaharia, R, & Franssen, J.-M. (2010). Numerical modelling of membrane action of composite slabs in fire situation. In V., Kodur & J.-M., Franssen (Eds.), *Proc. of the 6th Int. Conf. Structures in Fire* (pp. 474-483). Lancaster, PA, USA: DEStech Publications, Inc, Michigan State University, USA, Jun 2-4.
1. Rigo, P, & Gernay, T. (2009). Lock gates - Part B: Ship impact. *PIANC International Workshop-Incom WG29: Innovations in navigation lock design, Edt. Ph Rigo, PIANC* (pp. 25), Brussels, Belgium, Oct 15-16.

TECHNICAL REPORTS AND OTHER PROFESSIONAL PUBLICATIONS

4. Gernay, T., & Ni, S. (2020). "Timber High Rise Buildings and Fire Safety", prepared for the World Steel Association, Brussels, Belgium, 119 p. (Sept 2020).
3. Gernay, T., & Elhami Khorasani, N. (2020). "Moving Fuel Load Surveys to Digital Platforms", SFPE Europe digital magazine, issue 18 (July 2020).
2. Elhami Khorasani, N. & Gernay, T. (2020). "A Digitized Surveying Method Using Machine Vision to Collect Fuel Load Data in Buildings", SFPE eXTRA digital magazine, issue 51 (March 2020).
1. Elhami Khorasani, N., Salado Castillo, J.G., Saula, E., Josephs, T., Nurlybekova, G. & Gernay, T. (2019). "Digitized Fuel Load Survey Methodology Using Machine Vision", Report no. FPRF-2019-22 prepared for the NFPA Fire Protection Research Foundation, Quincy, MA.

INVITED PRESENTATIONS

19. Gernay T., Schafer BW. (2020). "Cold-Formed Steel Structural Design for Fire Conditions", AISI webinar, Aug 26.
18. Gernay T. (2020). "New AISI provisions for fire design of cold-formed steel members", AISC TC8, webinar, Aug 7.
17. Elhami Khorasani N., Gernay T. (2020). "Fuel load survey methodology in buildings", National Fire Protection Association (NFPA) webinar, Apr 2.
16. Gernay T., Bamonte P. (2019). "Proposal for ACI CRC Grant: Behavior and design of RC structures under parametric/natural fires", ACI/TMS Committee 216 meeting, Cincinnati, OH, USA, Oct 21.
15. Gernay, T. (2018). "Computational modeling of civil engineering structures at elevated temperature", CISMMS Workshop, Johns Hopkins University, MD, USA, Dec 12.
14. Gernay, T. (2018). "Computational modeling of concrete structures in fire", Seminar, The University of Edinburgh, Scotland, UK, Dec 10.
13. Gernay, T. (2018). "Fire resistance vs Burnout resistance", Lecture, University of Ghent, Belgium, Oct 31.
12. Gernay, T. (2017). "Computational modeling of concrete structures in fire", Fire Research Division seminar, NIST, Gaithersburg, MD, USA, Oct 3.
11. Gernay, T. (2017). "Performance-based fire safety engineering: Challenges and opportunities", awarding ceremony of the Int. Gustave Magnel Award, SECO, Brussels, Jun 1.
10. Gernay, T. (2017). "Computational models and probabilistic methods to improve infrastructure resilience to fire", Johns Hopkins Civil Engineering Department, Johns Hopkins University, MD, USA, Feb 13.
9. Gernay, T. (2016). "Developing system-level fragility functions for performance-based fire engineering of buildings", JCSS workshop on probabilistic methods in SFE, SP, Borås, Sweden, Oct 20.

8. Gernay, T. (2015). "Evaluating a city's vulnerability to fire following earthquake", research unit seminar, University of Liege, Belgium, Oct 23.
7. Gernay, T. (2015). "Building Structures in Fire: Insights from Numerical Models", Fulbright Outreach Lecture, AGM University San Juan, Puerto Rico, Mar 6.
6. Gernay, T. (2014). "A model for concrete in the fire situation and its application in structural fire engineering", Princeton CEE Department seminar, Princeton University, NJ, USA, Oct 21.
5. Gernay, T. (2014). "L'étude du béton dans le cadre de la sécurité incendie", Awarding ceremony AILg Award, University of Liege, Belgium, Mar 14.
4. Gernay, T. (2013). "A multiaxial constitutive model for concrete in the fire situation", Awarding Ceremony McKinsey & Company Award, McKinsey & Company office, Brussels, Belgium, Oct 16.
3. Gernay, T. (2012). "Modeling the mechanical behavior of concrete in the fire situation", Faculty of Applied Sciences seminar, University of Liege, Belgium, Apr 26.
2. Gernay, T. (2011). "Développement d'un modèle constitutif multiaxial de béton", research unit seminar, Commissariat à l'Énergie Atomique (CEA), Saclay, France, Mar 3.
1. Gernay, T. (2010). "De Paepe-Willems Award 2010: Optimization and analysis of lock gates in the framework of the Seine-Escaut Est waterway upgrading", PIANC Annual GA, Liverpool, U.K., May 10.

CONFERENCE PRESENTATIONS (WITHOUT PROCEEDINGS)

† - denotes presenter

16. Gernay T.†, Elhami Khorasani N. (2019). "Numerical analysis of a steel-frame building with composite floors to enable performance-based design", ASCE EMI, Caltech, CA, U.S.A., Jun 20.
15. Gernay T., Ni S.† (2019). "Incorporating software into a structural fire engineering course", ASCE SEI Structures Congress, Orlando, FL, U.S.A., Apr 25-27.
14. Elhami Khorasani N., Gernay T.†, Stephani A., Ni S., Van Coile R., Hopkin D. (2018). "Probabilistic strength retention factors for steel and concrete and effect on structural reliability of columns in fire", ASTM Workshop, Washington, D.C., U.S.A., Dec 7.
13. LaMalva K.†, Torero J., Bisby L. Gernay T., Solomon R., Morovat A., Jones C., Hantouche E., Gales J. (2018). "Re-examination of 'restrained vs unrestrained'", ASTM Workshop, Washington, D.C., U.S.A., Dec 7.
12. Qureshi R., Elhami Khorasani N.†, Gernay T. (2018). "The need of active boundary conditions for structural fire testing", ASCE EMI Conference, MIT Boston, MA, U.S.A., May 29 – Jun 1.
11. Gernay T.†, Gamba A., Elhami Khorasani N. (2018). "Behavior of steel frame structures under natural fire and collapse mechanisms during cooling", ASCE SEI Structures Congress, Fort Worth TX, U.S.A., Apr 21.
10. Elhami Khorasani N.†, Haase B., Fang C., Gernay T. (2017). "A comparison of prescriptive and performance-based designs for fire as a primary or secondary event", ASCE EMI Conference, UC San Diego, CA, U.S.A., Jun 6.
9. Achenbach M.†, Gernay T., Morgenthal G. (2017). "Quantification of model uncertainties", Meeting of the fib Commission TG 3.1 Reliability and safety evaluation, Torino, Italy, May 23-24.
8. Elhami Khorasani N.†, Gernay T., Garlock M. (2017). "Effects of various design parameters on system-level fire fragility functions for steel buildings", ASCE SEI Structures Congress, Denver, Colorado, Apr 7.
7. Haase B.†, Elhami Khorasani N., Gernay T., (2017). "Post-blast fire resistance of low-rise buildings through membrane action of composite floor slabs", ASCE SEI Structures Congress, Denver, Colorado, Apr 6.
6. Van Coile R.†, Molkens T., Gernay T., (2016). "Post-fire assessment of concrete structures. Safe for continued use?", Fireforum Congress, Brussels, Belgium, Nov 24.
5. Dumont F.†, Gernay T., Franssen J.M. (2016). "Uncertainties in determination of fire resistance by experimental testing and by calculation", Fireforum Congress, Brussels, Belgium, Nov 24.
4. Gernay T.†, Franssen J.M. (2016). "New features in SAFIR® 2016", Secure With Steel annual meeting,

ArcelorMittal R&D office, Luxemburg, Oct 27.

3. Gernay T.[†], Franssen J.M. (2015). "Future developments in SAFIR® 2016", Secure With Steel annual meeting, ArcelorMittal R&D office, Luxemburg, Nov 5.
2. Elhami Khorasani N.[†], Gernay T., Garlock M. (2015). "Resiliency of a Community of Buildings to Fire Following Earthquake", ASCE EMI, Stanford University, CA, USA, Jun 19.
1. Gernay T.[†], Franssen J.M. (2012). "New developments in SAFIR 2013 – New concrete models", Secure With Steel annual meeting, Brussels, Belgium, Nov 29.

TEACHING

Johns Hopkins University, Department of Civil and Systems Engineering, U.S.A.

Assistant Professor

Structural fire engineering – Elective undergraduate and graduate course, 3 credits

Spring 2018, 7 students (student evaluation: 4.50/5.00)

Spring 2019, 17 students (student evaluation: 4.82/5.00)

Spring 2020, 12 students (student evaluation: 4.58/5.00)

Graduate Seminar – Required graduate course, 1 credit

Fall 2020, 35 students

University of Liege, Department of Civil Engineering (ArGEnCo), Belgium

Adjunct Lecturer

Fire safety engineering - Master course, co-taught with Jean-Marc Franssen, Fall 16, Fall 17

Design for fire and robustness - SUSCOS Erasmus Mundus course, co-taught with J-F Demonceau, Fall 16

Maintenance, restoration and protection of buildings - Master course, co-taught with Luc Courard, Fall 15, 16

Lecturer for a Ph.D. Course

Behavior of structures subject to fire - 4-hour doctoral course, 25 students. Podcasted (in French). Spr 16

Teaching Assistant

Reinforced concrete structures - Bachelor course, run tutorials and grade exams, Fall 09-12

Integrated civil engineering project - Master course, assist students with their projects, Fall 09

Composite steel-concrete structures - Bachelor course, create assignments, Spr 08

Mathematical analysis - Bachelor course, create assignments, Spr 07

RESEARCH GROUP AND ADVISING

Postdoc Advisor

Dr. Shuna Ni (2018-2020). Johns Hopkins University, U.S.A. Now Assistant Professor at Utah State Univ.

Ph.D. Student Advisor

Xia Yan (2018-...). Johns Hopkins University, U.S.A.

Qi Tong (2019-...). Johns Hopkins University, U.S.A.

HyoungSeok Kim (2020-...). Johns Hopkins University, U.S.A

Master Student Advisor

Jiaqing Pei (2020). Johns Hopkins University, U.S.A.

Paul Van der Haert (2018). Johns Hopkins University, U.S.A.

Antonio Gamba (2017), Vlado Peric (2016). University of Liege, Belgium.

Co-advised: N. Binet (2017), A. Ragala (2016), A. Scifo (2013), S. Hollange (2012). Univ of Liege, Belgium.

Undergraduate Research Advisor

Yun Cheng (2019), Southeast University Nanjing China, 7-week research stay at JHU. Funded by the CSC.

Visiting Faculty

Prof. Ruben Van Coile (summer 2018), Ghent University. 6-week research stay at JHU. Funded by FWO.

Visiting Ph.D Student

Xin Liu (2019-2020), Tongji University. 1-year research stay at JHU. Funded by the CSC.

Internships

Laila Milevski (summer 2019), MICA. Art-Engineering internship at JHU. Funded by HEMI-MICA program.

Ph.D. Thesis Committee

Ranjit Kumar Chaudhary (2019-2022). Ghent University, Belgium.

Ramla Qureshi (2017-2020). University at Buffalo, N.Y., U.S.A.

Elke Mergny (2016-2020). University of Liege, Belgium.

Ana Sauca (2014-2017). University of Liege, Belgium.

PROFESSIONAL SERVICE

Editorial Positions

Associate Editor of *Fire Technology*, the peer-reviewed journal of the *National Fire Protection Assoc. (NFPA)* and the *Society of Fire Protection Engineering (SFPE)* published by Springer Nature (2019 – present).

Editorial Board Member, *Fire Safety Journal*, Elsevier (2020 – present).

Appointments

Associate, National Institute of Standards and Technology (NIST), MD, U.S.A. (2020 – present).

Principal investigator, Cold-Formed Steel Research Consortium (CFSRC) (2020 – present).

Scientific collaborator, University of Liege, Urban and Environmental Engineering Dept (2018 – present).

Member of scientific committees

• *Professional Association Committees*

ACI 562 Repair Code Committee, Subcommittee 562-0F Fire (2020 – present).

ACI 216 Fire Resistance and Fire Protection Committee (2019 – present).

fib TG 2.3 Performance-Based Fire Design of Concrete Structures, Task Group Leader (2019 – present).

AISI Sub-31 TG on Cold-Formed Steel Elevated Temperature Design Provisions (2019 – present).

ASCE/SEI Technical Committee on Fire Protection (2018 – present).

Contributor to CEN TC 250/SC 2/WG 1/ TG 5, Annex C of Eurocode 1992-1-2 for concrete columns in fire.

• *Conference Committees*

International Advisory committee of the CONFAB conference, Brunel University, UK, 8-9 Sep 2021.

Scientific committee of the 11th Int. Conference on Structures in Fire (SIF'20), Brisbane, 24-26 Jun 2020.

Scientific committee of the 6th Int. Symp. on Life-Cycle Civil Eng. (IALCCE2018), Ghent, 28-31 Oct 2018.

Scientific committee of the 10th Int. Conference on Structures in Fire (SIF'18), Ulster, UK, 6-8 Jun 2018.

Member of professional and scientific associations

International Federation for Structural Concrete (*fib*) (2020 – present).

International Association for Fire Safety Science (IAFSS) (2020 – present).

American Concrete Institute (ACI) (2019 – present).

Structural Engineering Institute (SEI) (2018 – present).

American Society of Civil Engineers (ASCE) (2018 – present).

Hopkins Extreme Materials Institute (HEMI) (2018 – present).

International Association for Life-Cycle Civil Engineering (IALCCE) (2017 – present).

Member of Ph.D. thesis evaluation committee

Aakash B. Satish (2020). Johns Hopkins University, U.S.A.

Jerome Randaxhe (2020). University of Trento, Italy.

Quang Xuan Le (2020). The University of Queensland, Australia.

Alberto Compagnone (2020). University of Naples Federico II, Italy.

Natasa Kalaba (2019). Politecnico di Milano, Italy.

Jamie Maclean (2018). The University of Edinburgh, U.K.

Gary Lin, (2018). Johns Hopkins University, U.S.A.

Guillem Peris-Sayol, (2017). Universidad Politécnica de Valencia, Spain.

Lijie Wang, (2017). University of Ghent, Belgium.

Ana Sauca, (2017). University of Liege, Belgium.

Activities as a reviewer for academic journals

Engineering Structures ▪ Fire Safety Journal ▪ International Journal of Solids and Structures ▪ Journal of Constructional Steel Research ▪ Construction and Building Materials ▪ Journal of Structural Engineering ASCE ▪ Journal of Engineering Mechanics ASCE ▪ Structural Concrete ▪ Fire Technology ▪ Fire and Materials ▪ Journal of Structural Fire Engineering ▪ International Journal of Mechanical Sciences ▪ Cement and Concrete Composites ▪ Thin-Walled Structures ▪ Reliability Engineering and System Safety ▪ Computers and Concrete ▪ International Journal of Damage Mechanics ▪ Structures ▪ Structural Engineering and Mechanics ▪ Advances in Engineering Software

<https://publons.com/researcher/476561/thomas-gernay>

Activities as a reviewer for funding grant agencies

CONICYT (Chilean National Commission Scientific & Technological Research): reviewer call REDES and PII.

Organization of congresses, conferences and workshops

(EMI Mini-symposium, Columbia University, U.S.A., 26-29 May 2020).

SAFIR training session, University of Liege, Belgium, 18-19 Dec 2019, 11 delegates

SAFIR training session, Johns Hopkins University, U.S.A., 10-11 Jun 2019, 8 delegates

SAFIR training session, University of Liege, Belgium, 7-8 Jan 2019, 14 delegates

SAFIR training session, Johns Hopkins University, U.S.A., 21-22 Jun 2018, 8 delegates

SAFIR workshop, Ulster University, Belfast, UK, 5 Jun 2018, 30 delegates

Department Day ArGEnCo (on the organizing committee), Liege, Belgium, 2 May 2017, 150 delegates

RUGC 2016 (on the organizing committee), Liege, Belgium, May 24-27 2016, 250 delegates

Chairmanship of sessions in international conferences

10th Int. Conf. on Structures in Fire (6-8 June, 2018) at Ulster University, Belfast, UK.

2nd International Fire Safety Symposium (7-9 June, 2017) in Naples, Italy.

WMCAUS (13-17 June, 2016) in Prague, Czech Republic.

9th Int. Conf. on Structures in Fire (8-10 June, 2016) at Princeton University, NJ, USA.

Service in the university administration

Johns Hopkins University, USA

Faculty Advisor, undergraduate class of 2024 (2020)

Faculty Search Committee (2020)

Undergraduate student recruitment (2019)

MSEM Advisor (2019)

GBO committee: A. Bangalore Satish (2019)

University of Liege, Belgium

Permanent Faculty Commission for Research, Faculty of Applied Sciences. (2015 to 2017)

Strategic Research Committee, Department of Civil Engineering. (2015 to 2017)
Faculty Council, Faculty of Applied Sciences. Elected scientific representative (2015 to 2017)
Doctorate College, Department of Civil Engineering (2014 to 2017)
Board for the Civil Engineering Study Council, Department of Civil Engineering (2012-13)
Department Council, Department of Civil Engineering (2012-13)

TRANSLATION

Software development

Co-author of the **software SAFIR®**, largely used in the field of structural fire engineering. Short courses are regularly conducted for practitioners including from the private sector.

Outreach activities

Participation to the Fulbright Outreach Lecturing Fund program with visits and research talks on three campuses administered by AGMUS in San Juan, Puerto Rico (2015).

Scientific vulgarization: “Témoignage T. Gernay – Bourse BAEF”, account of my experience as a BAEF Fellow for promoting mobility to students and researchers at University of Liege. Published online (2016).

Scientific vulgarization: “Expanding a Fulbright with the Outreach Lecturing Fund: Dr T. Gernay in Puerto Rico”, published online (2015).

“Ma thèse en 180 sec” Contest: “Bâtiments et structures: ne jouons pas avec le feu” (2013).

Media

“From Highways to High-Rises, Engineering Analysis May Drive New Uses for Automotive Steels”, JHU Hub, 30 Sep, 2020, <https://hub.jhu.edu/2020/09/30/automotive-steel-for-construction/>

“Interview: Improving fire safety by modelling buildings' fire behaviour with SAFIR 2019 - with Dr Gernay”, European Fire Safety Community, May 8, 2020, <https://eufiresafety.community/news/276956>

“Why the Notre Dame fire was so destructive, according to fire experts”, Vox, Apr 16, 2019 <https://www.vox.com/2019/4/16/18312072/notre-dame-cathedral-fire>

“Clearcut on i24News Live”, live TV Interview on Notre Dame fire, Apr 16, 2019, video accessible here: https://www.youtube.com/watch?v=MBVcHjK_N34&t=10s

“Q&A with Thomas Gernay – Next steps after the Notre Dame Cathedral fire”, JHU Whiting School of Engineering, Apr 16, 2019, video accessible here: https://www.youtube.com/watch?v=2LORGQAPv_w

“Safety First: Building a Resilient Future”, JHU Engineering Magazine, Spring 2019 edition, article accessible here: <https://engineering.jhu.edu/magazine/2019/05/safety-first/#.XYEFRyhKhPZ>