



dr. Alessandro Corbetta

University Researcher and NWO Veni fellow

General Information

Name, Surname Alessandro Corbetta
Nationality Italian
Date of birth 2nd November 1987
Place of birth Torino, Italy
Residence
Gender Male
Marital status
Military service

Academic Position

Since Jan. 2019 **University researcher (staff)**, *Technische Universiteit Eindhoven. Department of Applied Physics. Group: Turbulence and Vortex Dynamics, Eindhoven, NL.*
PI for the NWO-VENI project: "Understanding and controlling the flow of human crowds".

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Group page

Supervisor Prof. F.Toschi.

Chair of Computational Physics of Multi-scale Transport Phenomena

Research in brief My research activity deals with the modeling and the fundamental understanding of complex physical systems with particular attention to pedestrian crowd flows. To this aim I developed highly accurate measurement systems capable of acquiring high-fidelity individual trajectories in real-life venues. On the basis of the large trajectory datasets I collected, I develop quantitative models for the emergent physics of crowds. I am furthermore active in the application of recent machine and deep learning techniques to the analysis of highly complex and non-linear physical systems and, in particular, fluid turbulence.

Education

- 2016 **Ph.D. Applied Mathematics**, *Technische Universiteit Eindhoven. Centre for Analysis, Scientific Computing and Applications*, Eindhoven, NL.
Ph.D. Structural Engineering, *Polytechnic university of Turin. Department of Structural Engineering, Construction and Soil Mechanics*, Turin, IT.
Double Ph.D. Programme TU/Eindhoven - Polytechnic university of Turin.
Thesis: Multiscale Crowd Dynamics: Physical Analysis, Modeling and Applications.
Supervisors: Eindhoven: Prof. F. Toschi, Prof. A. Muntean, Turin: Prof. A. Tosin, Prof. L. Bruno
- 2011 **Msc. Applied Mathematics**, *Polytechnic university of Turin. Department of Mathematics.*, Turin, IT, 110/110 *cum laude*, GPA: 30/30.
Thesis (at Los Alamos National Laboratory (NM, US), T-5, Applied Mathematics and plasma physics): A general purpose object oriented particle-in-cell code with applications to FRC and Tokamak
Supervisors: Los Alamos: dr. Z.Guo, dr. S.Tang, dr. G.L.Delzanno, Turin: Prof. G.Coppa, Prof. N.Bellomo
- 2009 **Bsc. Mathematics for Engineering Sciences**, *Polytechnic university of Turin. Department of Mathematics.*, Turin, IT, 110/110 *cum laude*, GPA: 29.8/30.
Thesis: An introduction to the Hamiltonian and Lagrangian formulation of classical mechanics
Supervisor: Prof. J.Pejsachowitz
- 2006 **"Scientific" High school (Liceo Scientifico)**, *Giordano Bruno*, Turin, IT, 100/100 *cum laude*.

Languages

- Italian Native
- English Full professional proficiency *Living in English speaking countries (US, NL) since 2011.*
- French Basic communication skills

Previous Academic and non-Academic Positions

- 2016–2018 **Post-doctoral Researcher**, *Technische Universiteit Eindhoven. Department of Applied Physics - Group: Turbulence and Vortex Dynamics - Topical group: "Crowd-flow"*, Eindhoven, NL.
Position supported by the NWO-JSTP programme: "Vision driven visitor behaviour analysis and crowd management".
- 2013–2016 **Ph.D. Candidate in Applied Mathematics**, *Technische Universiteit Eindhoven. Centre for Analysis, Scientific Computing and Applications*, Eindhoven, NL.
- 2012–2016 **Ph.D. Candidate in Structural Engineering**, *Polytechnic university of Turin. Department of Structural Engineering, Construction and Soil Mechanics*, Turin, IT.
- Jan. 2014 **Consultant for Sintecna, s.r.l.**, *Milano Expo2015, design of New Holland pavilion, crowd traffic/safety simulations*, Turin, IT.
- 2011 **Visiting Student**, *Los Alamos National Laboratory. Theoretical division T5 - Plasma physics and applied mathematics*, Los Alamos, NM, USA.
- 2007–2010 **Student Assistant** (classes: Calculus I/II), *Polytechnic University of Turin, Department of Mathematics.*, Turin, IT.

Scientific Activity

Research

Field **Mathematical Modeling, Pedestrian Dynamics, Machine Learning**

Keywords Pedestrian dynamics and automated tracking

Statistical mechanics and Langevin equations in connection with big data analytics

Computer vision and Deep Neural Networks

Scientific and High Performance Computing, Scientific Data Management

Machine learning for physics and, in particular, fluid flows

Software design and Engineering

Grants

2018 **NWO VENI** Applied sciences division, *granted from the Netherlands Organisation for Scientific Research (NWO)*.

National competition (Dutch). Open to scientists within the 3rd year from their Phd. Success rate: $\approx 12\%$.

Project title: *Understanding and controlling the flow of human crowds*

Role Principal Investigator

Grant €327K (of which €250K from NWO and €77K from industrial stakeholders)

2018 **NWO Physical Sciences - Incidental financial support**, *granted from the Netherlands Organisation for Scientific Research (NWO)*.

Granted to support the Lorentz Center workshop: "Physics and Psychology of Human Crowd Dynamics".

Role Main applicant

Grant €2.3K

2017 **Lorentz Center Workshop**, *Title: "Physics and Psychology of Human Crowd Dynamics"*.

Granted to support the Lorentz Center workshop: "Physics and Psychology of Human Crowd Dynamics". To be held in November 2018 in Leiden, NL.

Role Main applicant (co-applicants: Dr. J.Drury, Dr. E.Ronchi, Prof. A.Seyfried, Prof. F.Toschi)

Grant €6.9K

2017 **4TU Research Centre Fluid and Solid Mechanics Valorisation Grant**, *Title: "Developing smart sensors for quantitative crowd flow experiments"*.

Valorisation partner: Philips Lighting Research (Dr. Sjoerd Mentink)

Role Co-applicant (with Prof. F.Toschi)

Grant €30K

2015 **NWO-JSTP**, Title: “*Vision driven visitor behaviour analysis and crowd management*”.

Role Participant (with Prof. F.Toschi, Prof. Q.Yu (SIAT Shenzhen, CN))

Grant €260K

Scholarships

2012–2015 **Italian PhD**, *Scholarship to fully sustain Italian PhD position at Polytechnic university of Turin.*

Competition based, 3 available positions in the Structural Engineering department

Grant About €40K

Organization of international academic events

Nov. 2018 **Lorentz Center Workshop**, *Physics and Psychology of Human Crowd Dynamics*, Leiden, NL.

Co-organizers: Dr. J.Drury, Dr. E.Ronchi, Prof. A.Seyfried, Prof. F.Toschi.

Themes: Pedestrian dynamics; Pedestrian tracking in real-life and in laboratory conditions; Crowd management; Safety management of crowds; Crowd psychology; Crowd evacuation; Machine and Deep learning based data acquisition.

website: <http://www.lorentzcenter.nl/lc/web/2018/1010/info.php3?wsid=1010&venue=0ort>

Referee Activity

Referee for Applied Mathematical Modeling | Physical Review E | IEEE Transactions on Circuits and Systems for Video Technology | Fire Technology | Physica A | Procedia Engineering | Transportation Research F

Students

ongoing Dario Chinelli (U Ferrara/Erasmus) - TU/Eindhoven

Bsc in Applied Physics. Topic: modeling pedestrian dynamics through path integral

ongoing Gerben Beintema - TU/Eindhoven

Msc in Applied Physics. Topic: machine learning non-linear dynamics

2019 Rick de Kreij - TU/Eindhoven

Bsc in Applied Physics. Thesis: “A multi-scale model for real-life pedestrian arrival processes”

2019 Lars Raaijmakers (Fontys) - TU/Eindhoven

Internship in Applied Physics. Thesis: “Learning conditional probability distributions from sampled data with application to kinetic simulations of fluids”

2018 Joris Willems - TU/Eindhoven

- Bsc in Applied Physics. Thesis: "Pedestrian Orientation: Accurate Measurements and Dynamics"
- 2018 Lars Schilders - TU/Eindhoven
Bsc in Applied Physics. Thesis: "Superposition of interactions in pedestrian dynamics"
- 2018 David Mahakian - California State University Long Beach (co-supervised with dr. C.Lee)
Msc in Applied Mathematics. Thesis: "Analyzing real-life pedestrian dynamics using Kalman filters"
- 2017-2018 Werner Kroneman - TU/Eindhoven
Scientific software developer and research assistant
- 2016 Jasper Meeusen - TU/Eindhoven
Msc in Applied Physics. Thesis: "Dense crowd dynamics"
- 2016 Diana Gonzalez - TU/Eindhoven
Msc in Sustainable Energy Technology. Thesis: "Anticipatory Lighting Control Systems" (with prof. E. van Loenen, prof. F. Toschi, ir. C. de Bakker).

Invited Talks

- Apr 2018 Event: Lighting Metropolis visits Eindhoven. Host: Intelligent Lighting Institute, TU/Eindhoven
Talk: "Illumination-driven crowd management"
- May 2018 Institute seminar, dept. of Physics, Theran University. Host: dr. M. Vaez Allaei
Talk: "High statistics measurements of pedestrian dynamics and modeling"
- Apr 2017 Invited panelist talk at "New approaches to evacuation modeling" (part of the 12th International Symposium on Fire Safety Science). Host: dr. E. Ronchi
Talk: "High statistics measurements of pedestrian dynamics and modeling"
- Feb 2017 Institute seminar, Juelich Forschungszentrum, DE. Hosts: dr. M. Boltes, prof. A. Seyfried
Talk: "High statistics measurements of pedestrian dynamics and modeling"

Scientific visits

- Jun 2018 National Research Council of Italy, Rome, IT
Prof. R.Benzi, dr. E.Cristiani
- Dec 2017 National Research Council of Italy, Rome, IT
dr. E.Cristiani

- Jul 2016 SIAT – Shenzhen Institutes of Advanced Technology, Chinese Academy of Science, Shenzhen CN
Prof. Q.Yu
- Jun 2016 University of Turin
Prof. G.Boffetta

Presentations to international Conferences (selection)

- Aug 2018 Pedestrian and Evacuation Dynamics 2018 (3 contributions) - Lund, SE
- Aug 2017 IEEE International Conference on Advanced Video and Signal based Surveillance - Lecce, IT
- Jul 2017 Traffic and Granular Flows 2017 (2 contributions, also session chair) - Washington, DC, US
- Mar 2017 American Physical Society, March meeting - New Orleans, LA , US
- Oct 2016 Pedestrian and Evacuation Dynamics 2016 - Hefei, CN
- Mar 2016 American Physical Society, March meeting - Baltimore, MD, US
- Oct 2015 Traffic and Granular Flows 2015 - Delft, NL
- Oct 2014 Pedestrian and Evacuation Dynamics 2014 - Delft, NL
- Jun 2014 EUROODYN 2014 (9th International Conference on Structural Dynamics, 3 contributions) - Porto, PT
- Nov 2011 American Physical Society, Division of Plasma Physics - Salt Lake City, UT

Active scientific collaborations

- University Prof. F.Toschi (TU/Eindhoven NL, stastical physics of complex systems)
- Prof. R.Benzi (Rome U, IT, complex systems)
- Prof. A.Muntean (Carlstad Univ SE, mathematical analysis and modeling)
- Prof. Q.Yu (SIAT-Shenzhen CN, computer vision)
- dr. V.Menkovski (TU/Eindhoven NL, machine learning for physics)
- dr. C.Lee (California State Long Beach US, mathematical modeling and simulation)
- dr. E.Cristiani (CNR-IAC IT, mathematical modeling, macroscopic tracking)
- dr. D.Sekulovski (Philips research NL, statistical modeling)
- dr. P.Ross (TU/Eindhoven NL, crowd-light interaction)
- dr. A.Haans (TU/Eindhoven NL, human-technology interaction)
- dr. I.Girotto (ICTP Trieste IT, High performance computing)
- Industry Naturalis Biodiversity Center, Leiden, NL
- Eindhoven Municipality, NL
- KPMG, Amstelveenm NL
- Amsterdam Municipality, NL
- ProRail, NL
- Legion limited, London, UK

Scientific projects portfolio and main professional skills

Brief summary My scientific interest focuses on providing a (statistical) mathematical description of social phenomena. In particular, I am interested in the quantitative study of crowd dynamics by means of high-statistics, high-resolution, observations of real-life human crowds. To this aim, over the last 6 years, I worked at the interface between field-experimentation (including hardware and software development) and mathematical modelling (including statistical physics and automated vision). I designed about 10 real-life crowd tracking experiments as well as the tools - from low-level hardware interfaces, to high-level software - to enable an unprecedented collection of several millions of real-life pedestrian trajectories. The innovative approaches, quantitative models and technological developments that I proposed brought to 9 accepted publications plus several in preparation. I have been also active in crowd dynamics modelling in connection with structural engineering. In particular, I tackled crowd-structure interaction issues occurring along walkways or footbridges. Crowd-structure interaction phenomena, yielding vibrations and, ultimately, structural collapse, impact on users' comfort, serviceability, and provoked several major accidents. Coupling innovative complex crowd dynamics and structural dynamics models, I authored 8 accepted publications. I established my multidisciplinary scientific perspective pursuing a double PhD program (yy. 2012-2016) in Applied Mathematics (TU/e, supervisors Prof. Toschi and Prof. Muntean) and Structural Engineering (Politecnico di Torino, supervisors Dr. Bruno and Dr. Tosin). Growing through my career, gaining technical know-how and multidisciplinary vision, I am building a solid and wide collaboration network boasting several scientific and technological partnerships.

Key achievements

- Since 2011 About 25 scientific publications in connection with Mathematical modeling, statistical physics and machine learning which received more than 170 citations (Google scholar bibliometric data). These are reported below in the Section "publications".
- Since 2014 Main developer and architect of a real-time real-life pedestrian tracking system for crowd analytics. Through this system I've been collecting massive data (several millions trajectories) in various locations to power statistical mechanics-like research. The system is currently deployed at Naturalis Biodiversity Center, at TU/e campus, at Glow festivals 2016 ("Influx" exhibit) and 2017 ("Moving Light" exhibit).
- 2013 Produce continuous (fluid-like) and particle (agent based) simulations for crowd dynamics in built environment, possibly including dynamic structural response (C++, Matlab).
- 2011 Developed the core component of the Los Alamos Plasma Simulation (LAPS) code (C++, OpenMP, TMP, Matlab): a parallel particle-in-cell code characterized by extreme modularity resolved at compile-time by means of template metaprogramming techniques. Used LAPS to analyze the chaotic motion of charged particles in Field Reversed Configurations and Tokamaks.

IT Skills

Since my infancy I have been an active software developer. As of now I have advanced knowledge of several programming language, many which I use in my daily work. (Stackoverflow.com profile: 1714661)

Fluent/daily user of Python for HPC, web and administration (scipy stack, pandas, numba, cython, ipython, scoop, tornado, django, pelican, jinja2, fabric, plotly and many others) | Artificial Intelligence Libraries (Keras, TensorFlow) | C/C++ (openmp, selected template metaprogramming), cmake, regex | Web (backend + scientists-level frontend. html(5), jquery, bootstrap, angularjs, websocket for realtime communication) | (post-gre)SQL, Bash, Linux/server administration, scheduling and automation, Docker, Matlab, Latex

Highly experienced in object-oriented design/UML, policy oriented design, scalable design, several programming patterns, (unit-)testing and continuous integration, version control (git - since 2015 administrator of gitlab server with 190+ Users and 650+ project, took care of most of the CI design therein).

Occasional user C#, css, Java, VB, Powershell, Mathematica, many more

Teaching

- 2019 **Co-director and lecturer**, *7th Workshop on Collaborative Scientific Software Development (III level education in computational sciences - two weeks, May 2019)*, International Center for Theoretical Physics (ICTP) Trieste/UNESCO.
- 2018 **Teaching assistant**, *Computational and Mathematical Physics, Msc in Applied Physics*, Eindhoven University of Technology.
Chair: Prof. F.Toschi
- 2018 **Invited Lecturer**, *6th Workshop on Collaborative Scientific Software Development and Management of Open Source Scientific Packages (III level education in computational sciences - two weeks, May 2018)*, Sharif University of Technology, Theran, Iran. Organization: Sharif University of Technology, International Center for Theoretical Physics (ICTP) Trieste/UNESCO.
Gave lectures on: floating point arithmetic, code testing, (distributed) version control and continuous integration. More information at <http://indico.ictp.it/event/8346/>
- 2017 **Teaching assistant**, *Computational and Mathematical Physics, Msc in Applied Physics*, Eindhoven University of Technology.
Chair: Prof. F.Toschi
- 2017 **Teaching assistant**, *Computational and Mathematical Physics, Msc in Applied Physics*, Eindhoven University of Technology.
Chair: Prof. F.Toschi

References

Prof.dr. Federico Toschi, *Eindhoven University of Technology*, Eindhoven, NL.
f.toschi@tue.nl

Dr. Chung-min Lee, *California State University Long Beach*, Long Beach, CA, US.
Chung-min.Lee@csulb.edu

Prof.dr. Adrian Muntean, *Carlstad University*, Carlstad, SE.
adrian.muntean@kau.se

Dr. Ivan Girotto, *International Center for Theoretical Physics*, Trieste, IT.
igiroto@ictp.it

Scientific Publications

Journal Papers

- (1) A. Corbetta, J.A. Meeusen, C. Lee, R. Benzi, F. Toschi. *Physics-based modeling and data representation of pairwise interactions among pedestrians*. Phys. Rev. E. 98, 062310, 2018 - [↗](#)
- (2) A. Corbetta, C. Lee, R. Benzi, A. Muntean, F. Toschi. *Fluctuations around mean walking behaviours in diluted pedestrian flows*. Phys. Rev. E. 95, 032316, 2017 - [↗](#)
- (3) A. Corbetta, C. Lee, A. Muntean, F. Toschi. *Frame vs. trajectory analyses of pedestrian dynamics asymmetries in a staircase landing*. Collective Dynamics, 1, 1-26, 2017 - [↗](#)
- (4) L. Bruno, A. Corbetta. *Uncertainties in crowd dynamic loading of footbridges: a novel multi-scale model of pedestrian traffic*. Eng. Struct. 147C, 545-566, 2017 - [↗](#)
- (5) L. Bruno, A. Corbetta, A. Tosin. *From individual behaviour to an evaluation of the collective evolution of crowds along footbridges*. J. Engrg. Math., 101(1):153-173, 2016 - [↗](#)
- (6) F. Venuti, V. Racic, A. Corbetta. *Modelling framework for dynamic interaction between multiple pedestrians and vertical vibrations of footbridges*. J. Sound Vibrat. 379, 245-263, 2016 - [↗](#)
- (7) A. Corbetta, A. Tosin. *Comparing first order microscopic and macroscopic crowd models for an increasing number of massive agents*. Adv. Math. Phys., 2016:6902086/1-17, 2016 - [↗](#)
- (8) A. Corbetta, A. Muntean, K. Vafayi. *Parameter estimation of social forces in pedestrian dynamics models via a probabilistic method*. Math. Biosci. Eng., 12 (2), 337-356, 2015 - [↗](#)

Book Chapters

- (1) A. Corbetta, F. Toschi. *Path-integral representation of diluted pedestrian dynamics*. in 'Complexity Science. An introduction'. Eds. M. Peletier, R. Van Santen, E. Steur. World Scientific. To appear., 2019 - [↗](#)
- (2) A. Corbetta, C. Lee, A. Muntean, F. Toschi. *Asymmetric pedestrian dynamics on a staircase landing from continuous measurements*. In W. Daamen & V.L. Knoop (Eds.), Traffic and Granular Flow '15 (pp. 49-56). Berlin: Springer, 2016 - [↗](#)

Conference Proceedings

- (1) J. Adrian, N. Bode, M. Amos, M. Baratchi, M. Beermann, M. Boltes, A. Corbetta, G. Dezechache, J. Drury, Z. Fu, R. Geraerts, S. Gwynne, G. Hofinger, A. Hunt, T. Kanters, A. Kneidl, K. Konya, G. Köster, M. Küpper, G. Michalareas, F. Neville, E. Ntontis, S. Reicher, E. Ronchi, A. Schadschneider, A. Seyfried, A. Shipman, A. Sieben, M. Spearpoint, G. Sullivan, A. Templeton, F. Toschi, Z. Yücel, F. Zanlungo, I. Zuriguel, N. van der Wal, F. van Schadewijk, C. von Krüchten, N. Wijermans. *A Glossary for Research on Human Crowd Dynamics*. *Collective Dynamics*, 4, 1-13, 2019 - [↗](#)
- (2) A. Corbetta, W. Kroneman, M. Donners, A. Haans, P. Ross, M. Trouwborst, S. vd Wijdeven, M. Hultermans, D. Sekulowski, F. vd Heijden, S. Mentink, F. Toschi. *A large-scale real-life crowd steering experiment via arrow-like stimuli*. To appear: *Pedestrian and Evacuation Dynamics 2018*, 2018 - [↗](#)
- (3) W. Kroneman, A. Corbetta, F. Toschi. *Accurate pedestrian localization via height-augmented HOG*. To appear: *Pedestrian and Evacuation Dynamics 2018*, 2018 - [↗](#)
- (4) E. Cristiani, A. Corbetta, C. Balzotti, R. Natalini, S. Suriano, F. Toschi. *Forecasting visitors' behaviour in crowded museums*. To appear: *Pedestrian and Evacuation Dynamics 2018*, 2018 - [↗](#)
- (5) A. Corbetta, V. Menkovski, F. Toschi. *Weakly supervised training of deep convolutional neural networks for overhead pedestrian localization in depth fields*. *IEEE International Conference on Advanced Video and Signal based Surveillance (AVSS 2017 - 2nd Workshop on Signal Processing for Understanding Crowd Dynamics)*, 2017 - [↗](#)
- (6) R. Benzi, L. Biferale, F. Bonaccorso, H. Clercx, A. Corbetta, W. Moebius, F. Toschi, F. Salvatore, C. Cacciari, G. Erbacci. *TurBase: a software platform for research in experimental and numerical fluid dynamics*. *International Conference on High Performance Computing & Simulation (HPCS 2017 - 4th International Symposium on Big Data Principles, Architectures & Applications)*, 2017 - [↗](#)
- (7) D. Song, Q. Yu, A. Corbetta. *Depth Driven People Counting Using Deep Region Proposal Network*. *IEEE International Conference on Information and Automation (ICIA 2017)*, 2017 - [↗](#)
- (8) A. Corbetta, F. Toschi. *Overhead pedestrian tracking for large scale real-life crowd dynamics analyses*. *New approaches to evacuation modelling*, Lund University Fire Safety Engineering Report, 40-51, E. Ronchi editor (as part of the 12th International Symposium on Fire Safety Science - invited panelist contribution), 2017 - [↗](#)
- (9) F. Venuti, V. Racic, A. Corbetta. *Modelling framework of pedestrian-footbridge interaction in vertical direction*. *Procedia Engineering 1999*, 2901–2906. (10th International Conference on Structural Dynamics, EUROODYN 2017), 2017 - [↗](#)
- (10) A. Corbetta, J.A. Meeusen, C. Lee, F. Toschi. *Continuous measurements of real-life bidirectional pedestrian flows on a wide walkway*. *Proceedings of Pedestrian and Evacuation Dynamics 2016*, 18-24 (Special Issue on Collective Dynamics), 2016 - [↗](#)
- (11) A. Corbetta, L. Bruno, A. Muntean, F. Toschi. *High statistics measurements of pedestrian dynamics*. *Transportation Research Procedia*, 2, 96-104, 2014 - [↗](#)

- (12) L. Bruno, A. Corbetta. *Multiscale probabilistic evaluation of the footbridge crowding. Part 2: Crossing pedestrian position.* Proceedings of the 9th International Conference on Structural Dynamics, EURODYN 2014, 937-944, 2014 - [↗](#)
- (13) L. Bruno, A. Corbetta. *Multiscale probabilistic evaluation of the footbridge crowding. Part 1: Incoming pedestrian density.* Proceedings of the 9th International Conference on Structural Dynamics, EURODYN 2014, 929-937, 2014 - [↗](#)
- (14) F. Venuti, V. Racic, A. Corbetta. *Pedestrian-structure interaction in the vertical direction: coupled oscillator-force model for vibration serviceability assessment.* Proceedings of the 9th International Conference on Structural Dynamics, EURODYN 2014, 915-920, 2014 - [↗](#)

Submitted Papers

- (1) J. Visser, A. Corbetta, V. Menkovski, F. Toschi. *StampNet: unsupervised multi-class object discovery.* submitted, 2019 - [↗](#)
- (2) E. Ronchi, A. Corbetta, E. Galea, M. Kinateder, E. Kuligowski, D. McGrath, A. Pel, Y. Shiban, P. Thompson, F. toschi. *New approaches to evacuation modelling for fire safety engineering applications.* submitted, 2018 - [↗](#)

Datasets

- (1) A. Corbetta, F. Toschi. *Crowdflow – diluted pedestrian dynamics in the Metaforum building of Eindhoven University of Technology.* 4TU.Centre for Research Data, 2017 - [↗](#)

Selected Conference Posters

- (1) C. Balzotti, M. Briani, A. Corbetta, E. Cristiani, M. Minozzi, R. Natalini, S. Suriano, F. Toschi. *Forecasting visitors' behaviour in crowded museums - a case study: the Galleria Borghese in Rome.* Pedestrian and Evacuation Dynamics 2018, 2018 - [↗](#)
- (2) A. Corbetta, M. Donners, A. Haans, F. vd Heijden, M. Hoekstra, M. Hultermans, I. Iuncu, W. Kroneman, T. LeJeune, B. Maas, S. Mentink, R. Nuij, P. Ross, S. Schippers, F. Toschi, M. Trouwborst, S. vd Wijdeven, W. Willaert. *Moving Light: can light steer a crowd?.* ILIAD Intelligent Lighting Institute TU/e outreach event 2017 (winner of 2nd best poster), 2017 - [↗](#)
- (3) A. Corbetta, C. Lee, J. Meeusen, R. Benzi, A. Muntean, F. Toschi. *The role of fluctuations and interactions in pedestrian dynamics.* Physics@Veldhoven, Veldhoven 17-18/01, 2017 - [↗](#)
- (4) A. Corbetta, V. Menkovski, F. Toschi. *Improving Measurements of Pedestrian Dynamics using Deep Neural Networks.* Traffic and Granular Flow 17, Washington DC, 2017 - [↗](#)
- (5) A. Corbetta, Z. Guo, G.L. Delzanno, B. Srinivasan, J. Brown, X. Tang. *LAPS parallel data and communication for particle method.* APS, Division of Plasma Physics, Salt Lake City, 15/11, 2011 - [↗](#)

Theses

- (1) A. Corbetta. *Multiscale crowd dynamics: physical analysis, modeling and applications.* Ph.D. Thesis, Eindhoven University of Technology, 2016 - [↗](#)

- (2) A. Corbetta. *A general purpose object oriented particle-in-cell code with applications to FRC and Tokamak*. Msc. Thesis, Polytechnic University of Turin, Los Alamos National Lab., 2011 - [↗](#)
- (3) A. Corbetta. *An introduction to the Hamiltonian and Lagrangian formulation of classical mechanics*. Bsc. Thesis, Polytechnic University of Turin (in Italian), 2009 - [↗](#)

Other and Popular Science Articles

- (1) A. Corbetta, F. Toschi. *Moving light: understanding and steering the flow of pedestrian crowds*. ILI Spring Magazine 2018 (Intelligent Lighting Institute TU/e magazine), 2018 - [↗](#)
- (2) A. Haans, A. Corbetta, F. Toschi. *INFLUX: a GLOW installation and large scale naturalistic experiment*. ILI GLOW Magazine 2016 (Intelligent Lighting Institute TU/e magazine), 2016 - [↗](#)
- (3) N. Budko, A. Corbetta, B. van Duijn, S. Hille, O. Krehel, V. Rottschäfer, L. Wiegman, D. Zhelyazov. *Oxygen transport and consumption in germinating seeds*. 90th European Study Group Mathematics with Industry, SWI 2013, At Leiden, Volume: Proceedings of the 90th European Study Group Mathematics with Industry, pp. 5-30, 2013 - [↗](#)