



Personal information

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Home page	www.irc.atr.jp/~zanlungo/
Nationality	Italian, Holder of Japanese permanent residence permit
Date of birth	10/03/1976
Gender	Male

Research keywords

Complex Systems Modelling, Crowd Behaviour, Simulations, Robotics

Professional experience

October 2022 - Present	Contract consultant Standard AI, San Francisco, US
October 2021 - Present	Contract lecturer Okayama University, Okayama, Japan
April 2021 - Present	Lecturer International Professional University of Technology, Osaka, Japan Permanent position
April 2020 - Present	Part time researcher Okayama University, Okayama, Japan Studying the behaviour of pedestrians and robot-pedestrian interactions
April 2017-March 2020 June 2020-Present	Collaborative researcher Intelligent Robotics and Communication Laboratories, ATR, Kyoto, Japan Studying the behaviour of pedestrians and robot-pedestrian interactions
November 2016-March 2017	Researcher

	Intelligent Robotics and Communication Laboratories, ATR, Kyoto, Japan Studying the behaviour of pedestrians and robot-pedestrian interactions
2015-2016	Lecturer in Applied Mathematics Kingston University, London, UK Faculty of Science, Engineering and Computing, School of Computer Science and Mathematics Tenured position , resigned to go back to Japan for family related reasons
2009-2015	Researcher Intelligent Robotics and Communication Laboratories, ATR, Kyoto, Japan Studying the behaviour of pedestrians and robot-pedestrian interactions
November 2008 and September 2009	Visiting researcher CPT (Theoretical Physics Center), Marseilles, France Collaboration with Prof. Sandro Vaienti
2008	Instructor Milan Polytechnic University Teaching Introductory course of Mathematics ("College Algebra")
2007-2009	Post-doctoral researcher University of Bologna Analysis of the effect of random noise and numerical round-off on discrete maps
June-September 2005	Visiting researcher Artificial Life Laboratory at Nagoya University Collaboration with Prof. Takaya Arita
Journal editing	
From August 2018	Area Editor Simulation Modelling Practice and Theory, Elsevier
Professional experience outside research	
From 2017	Instructor of conversational Italian language Japan-Italy Society of Okayama
Education and training	
2004-2007	Ph.D. course
Major	Theoretical Physics
Institution	Graduate school of Physics, University of Bologna, Italy
Graduation Thesis	Microscopic Dynamics of Artificial Life Systems, supervised by Prof. Giorgio Turchetti
2003	Japanese language education
Institution	Yamasa Language school, Okazaki-shi, Aichi-ken, Japan

2002	Italian Laurea in Physics <i>(The Italian “Laurea” is legally equivalent to a Master degree. To obtain the degree, the candidate was supposed to work on a one year Graduation Thesis project requiring original research.)</i>																																																																																								
Major	Theoretical Physics																																																																																								
Institution	University of Milan, Italy																																																																																								
Graduation Thesis	Studio numerico della cascata ultravioletta nel modello ϕ^4 classico (in Italian), supervised by Prof. Claudio Destri																																																																																								
Languages																																																																																									
Mother tongue	Italian																																																																																								
Self-assessment European level ^(*)	<table><tr><th colspan="4">Understanding</th><th colspan="4">Speaking</th><th colspan="2" rowspan="2">Writing</th></tr><tr><th colspan="2">Listening</th><th colspan="2">Reading</th><th colspan="2">Spoken interaction</th><th colspan="2">Spoken production</th></tr><tr><td>C2</td><td>Proficient user</td><td>C2</td><td>Proficient user</td><td>C2</td><td>Proficient user</td><td>C2</td><td>Proficient user</td><td>C2</td><td>Proficient user</td></tr><tr><td>C1</td><td>Proficient user</td><td>C1</td><td>Proficient user</td><td>C1</td><td>Proficient user</td><td>C1</td><td>Proficient user</td><td>C1</td><td>Proficient user</td></tr><tr><td>C2</td><td>Proficient user</td><td>C2</td><td>Proficient user</td><td>C1</td><td>Proficient user</td><td>C1</td><td>Proficient user</td><td>C1</td><td>Proficient user</td></tr><tr><td>C1</td><td>Proficient user</td><td>C1</td><td>Proficient user</td><td>B2</td><td>Independent user</td><td>B2</td><td>Independent user</td><td>B1</td><td>Independent user</td></tr><tr><td>B2</td><td>Independent user</td><td>C1</td><td>Proficient user</td><td>B1</td><td>Independent user</td><td>B1</td><td>Independent user</td><td>A2</td><td>Basic user</td></tr><tr><td>A2</td><td>Basic user</td><td>A2</td><td>Basic user</td><td>A2</td><td>Basic user</td><td>A1</td><td>Basic user</td><td>A2</td><td>Basic user</td></tr><tr><td>A1</td><td>Basic user</td><td>A2</td><td>Basic user</td><td>A1</td><td>Basic user</td><td>A1</td><td>Basic user</td><td>A2</td><td>Basic user</td></tr></table> ^(*) Common European Framework of Reference (CEF) level ^(**) Holder of first (highest) level of Japanese proficiency, approved in 2008	Understanding				Speaking				Writing		Listening		Reading		Spoken interaction		Spoken production		C2	Proficient user	C2	Proficient user	C2	Proficient user	C2	Proficient user	C2	Proficient user	C1	Proficient user	C1	Proficient user	C1	Proficient user	C1	Proficient user	C1	Proficient user	C2	Proficient user	C2	Proficient user	C1	Proficient user	C1	Proficient user	C1	Proficient user	C1	Proficient user	C1	Proficient user	B2	Independent user	B2	Independent user	B1	Independent user	B2	Independent user	C1	Proficient user	B1	Independent user	B1	Independent user	A2	Basic user	A2	Basic user	A2	Basic user	A2	Basic user	A1	Basic user	A2	Basic user	A1	Basic user	A2	Basic user	A1	Basic user	A1	Basic user	A2	Basic user
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Mandarin Chinese																																																																																									
External funding																																																																																									
2022-	Collaborative researcher in the Advanced Mathematical Science for Mobility Society of Kyoto University (Unit leader: Prof S. Tsujimoto)																																																																																								
2021	Collaborative researcher in the JSPS Kiban-A 18H04121 project <i>Research and development for mobile HRI and its interaction design theory</i> (Principal investigator T. Kanda) Granted by the Japan Society for the Promotion of Science Budget 2M Japanese Yen																																																																																								
2016	I was, along with two colleagues, part of the Kingston University team that prepared the proposal for the H2020 EU “Monica” project, to which 26 European universities, research centres, industries and public institutions participated. The project has been approved with a budget of 15 million euros, 1 million of them corresponding to the Kingston University unit.																																																																																								
Awards																																																																																									
2016	Awarded a Kingston University Mres studentship (i.e., a fund for a Master student)																																																																																								
Experience in event organisation																																																																																									
2006-2009	In-chief of the organising committee The Italian workshop on Biophysics (Biophys’06-09), held annually in Arcidosso, Grosseto, Italy.																																																																																								
Computer skills																																																																																									
C, C++, Fortran, Matlab, Mathematica MS Office, HTML Latex																																																																																									

Additional information	
Home page	www.irc.atr.jp/~zanlungo/
Driving licence(s)	B (cars)
Personal interests	Foreign languages, swimming, running, cycling, basketball, traveling, music, digital photography, books in general, my family.
Teaching experience	
From 2021	Contract Lecturer at Okayama University, Okayama, Japan <i>Teaching "Mechanics" (in Japanese)</i>
From 2021	Lecturer at the International Professional University of Technology, Osaka, Japan <i>Teaching courses in "Linear Algebra" (in Japanese, starting from 2021/9), "Probability and Statistics" (in Japanese, starting from 2022/4) and Scientific English (starting from 2023/4)</i>
In 2018	Contract Lecturer at Okayama University, Okayama, Japan <i>Teaching "Global Studies II"</i>
2016-2017 (Appointed, and prepared lecture notes, before resigning)	Applications of Calculus, Partial Differential Equations module, School of Computer Science and Mathematics, Kingston University <i>This undergraduate course introduced the theory of Linear Partial Differential Equations. The course started with an introduction to the geometrical meaning of vector calculus leading to the expression of the Laplace operator in the principal curvilinear coordinate systems. Then the Heat, Wave, Poisson and Schrödinger equations were introduced, along with separation of variables solutions in Cartesian and spherical coordinates.</i>
Course notes	https://www.dropbox.com/s/ja2arlaweqycn8b/notes_prova.pdf?dl=0
2015-2016	Mathematical and Numerical Methods, Numerical Linear Algebra module, School of Computer Science and Mathematics, Kingston University <i>This undergraduate course revised the main theoretical concepts of linear algebra (linear systems, vector space, linear operators, vector and matrix norm, contraction theorem, eigenvalues and eigenvectors, matrix diagonalisation), and introduced numerical algorithms for the solution of related problems (Gaussian Elimination, LU decomposition, iterative methods, eigenvalue power method).</i>
Course notes	https://www.dropbox.com/s/z7d28niwldy734m/notes.pdf?dl=0
2015-2016	Mathematical Models and Computation, Programming module, School of Computer Science and Mathematics, Kingston University <i>This undergraduate course introduced the fundamental sorting and search algorithms, along with the theoretical concepts necessary for their analysis (algorithm complexity). Part of the course was directed to practical exercitations aimed at acquiring the abilities for performing scientific programming.</i>
2015-2016	Engineering Mathematics and Computing, School of Civil Engineering, Kingston University <i>This undergraduate course revised the fundamental concepts of applied calculus (up to ordinary differential equations) and taught how to solve the related problems by Matlab.</i>
2008-2009	Analytical Mechanics, Instructed by Prof. Turchetti and F. Zanlungo, Dep. of Physics, Bologna University <i>This course was focused on a throughout analysis of Lagrangian Mechanics (Lagrange equations, symmetries, central field, two body problem, stability, small oscillations, rigid body) and a solid introduction to Hamiltonian dynamics (Hamilton equations, canonical transformations, Noether theorem, integrable systems, Liouville theorem, ergodicity). My task on the course was to give part of the theoretical classes.</i>

2008-2009	<p>Teaching assistant of the Institutions of Mathematics course, Instructed by Prof. Bazzani, Milan Polytechnic University</p> <p><i>An introductory calculus course, focused in particular on the concepts of real numbers, functions, limits and derivation, along with some notions of linear algebra. My task on the course was to give some theoretical classes in absence of Prof. Bazzani, hold practice sessions and prepare examination tests.</i></p>
2008	<p>Introductory course of Mathematics ("College Algebra"), Milan Polytechnic University</p> <p><i>A course intended for those students that passed the University entry exam but scored poorly in mathematics, focused mainly on the concept of elementary real functions.</i></p>
2007-2008	<p>Teaching assistant of the Numerical Methods course, Instructed by Profs. Turchetti and Bazzani, Master course in Physics, Bologna University</p> <p><i>This course was focused on an introduction of numerical methods for physical sciences (interpolation, numerical solution of non linear equations, numerical integration, numerical solution of differential equations, stochastic systems). My task on the course was to give a few theoretical classes and to assist students during practice sessions.</i></p>
2007-2008	<p>Teaching assistant of the Complex Systems Laboratory course, Instructed by Dr. Giorgini, Dep. of Physics, Bologna University</p> <p><i>For this course, I prepared lectures on genetic algorithms, population dynamics (evolutionary game theory) and neural networks.</i></p>

Research experience

Crowd dynamics

Mathematical modelling of pedestrian behaviour, crowd dynamics and group behaviour, in collaboration with T. Kanda

In ATR we collected a large amount of data concerning the behaviour of pedestrians in experimental settings and in real world environments, which I used to develop original models of pedestrian and crowd dynamics. More in detail, the major findings regarded:

1. The need to include a velocity dependent potential in a collision avoiding model for pedestrians, and the development of a corresponding mathematical and computational model [15].
2. The improvement of the above model by taking in account the asymmetrical shape of human bodies [3], an analysis based on the dynamics of cross-flows [2,23].
3. The development of “Congestion Number”, a mathematical tool to assess the state of a human pedestrian crowd [1,25], (in collaboration with the Nishinari lab. of Tokyo University)
4. The tendency of (Japanese) pedestrians to walk on the left side of corridors, and to overtake other pedestrians on the right side, and the development of a method to introduce in a realistic way such a tendency in any pedestrian collision avoidance model [14,43].
5. Large pedestrian groups are not stable, and usually break up in more stable 2 or 3 pedestrian sub-units [41].
6. A mathematical model for the behaviour of social pedestrian groups, which was able to correctly predict the shape and velocity of pedestrian groups in low density, large environments [12].
7. Empirical study and mathematical modelling of how crowd density and other environment features affect the behaviour of pedestrians and in particular of groups [9,10,39,40].
8. How group composition and social roles affect the behaviour of pedestrian groups, and how this information may be used to automatically recognise groups and their composition [4,5,8,24,26,28,31,32,38].
9. How gestures affect the behaviour of pedestrian groups [7,34].
10. How the presence of groups affects crowd dynamics [29]

Human-Robot interaction

Socially acceptable mobile robot navigation, in collaboration with T. Kanda

While working at ATR I have been also involved in more engineering oriented works, such as the development of a robot able to smoothly navigate inside a human crowd [11,27,33,35,44,46], and the development of algorithms to automatically detect pedestrian walking goals [42] and pedestrian groups [13,36,45].

Discrete chaotic systems

Analysis of the effect of noise on discrete maps, in collaboration with S. Vaienti and G. Turchetti

Development of a method to find a threshold beyond which the numerical results on chaotic maps are not reliable, and analysis of the differences between the effect of random noise and the effect of numerical round-off on the dynamics of the map [16,17,18].

Evolutionary dynamics of agent systems

Microscopic Dynamics of Artificial Life Systems (Ph.D. thesis, sup. G. Turchetti, in collaboration with T. Arita)

Using an approach combining cellular automata or agent models with differential equation (replicator dynamics) models, I studied:

1. The Immune System T cell clonal expansion **[22]**.
2. The relation between the evolution of collision avoidance strategies and the evolution of a *Theory of Mind* **[21,48,49]**.
3. The evolution of “traffic conventions” (such as driving on the left or right side of streets) in a mobility system **[19,50]**.
4. The consequences of the fact that interactions dependent on vision (such as the collision avoidance in crowd dynamics) do not follow the action-reaction law of dynamics **[20,30]**.

Numerical study of statistical properties of relativistic fields

Numerical study of the ultraviolet cascade in ϕ^4 classical model (Master thesis, sup. C. Destri)

Using a numerical algorithm that treats time and space in a symmetrical way, preserving thus the relativistic structure of the field theory, and conserving energy at machine precision, I studied the energy diffusion to the higher (ultraviolet) modes of a relativistic scalar field with a quartic interaction term. The results were compared with a more traditional numerical treatment of hyperbolic partial differential equations.

Publications

Journal papers and book chapters

- 1 F. Zanlungo, C. Feliciani, Z. Yücel, X. Jia, K. Nishinari, T. Kanda
A pure number to assess “congestion” in pedestrian crowds
Transportation Research Part C: Emerging Technologies 148, 104041, 2023
<https://doi.org/10.1016/j.trc.2023.104041> **(2022 impact factor 9.021)**
- 2 F. Zanlungo, C. Feliciani, Z. Yücel, K. Nishinari, T. Kanda
Macroscopic and microscopic dynamics of a pedestrian cross-flow: Part II, modelling
Safety Science 158, 105969, 2023
<https://doi.org/10.1016/j.ssci.2022.105969> **(2022 impact factor 6.392)**
- 3 F. Zanlungo, C. Feliciani, Z. Yücel, K. Nishinari, T. Kanda
Macroscopic and microscopic dynamics of a pedestrian cross-flow: Part I, experimental analysis
Safety Science 158, 105953, 2023
<https://doi.org/10.1016/j.ssci.2022.105953> **(2022 impact factor 6.392)**
- 4 F. Zanlungo, Z. Yücel, T. Kanda
Intrinsic group behaviour II: On the dependence of triad spatial dynamics on social and personal features; and on the effect of social interaction on small group dynamics
PloS One, Vol 14, No 12, pp e0225704, 2019
doi: 10.1371/journal.pone.0225704 **(impact factor 2.776)**
- 5 Z. Yücel, F. Zanlungo, C. Feliciani, Claudio, A. Gregorj, T. Kanda
Identification of social relation within pedestrian dyads
PloS One, Vol 14, No 10, pp e0223656, 2019
doi: 10.1371/journal.pone.0223656 **(impact factor 2.776)**
- 6 39 authors including F. Zanlungo
A Glossary for Research on Human Crowd Dynamics
Collective Dynamics, Vol. 4, pp. 1-13, 2019
doi: 10.17815/CD.2019.19
- 7 Z. Yücel, F. Zanlungo and M. Shiomi
Modeling the impact of interaction on pedestrian group motion
Advanced Robotics, Vol. 32, No 3, pp. 137-147, 2018 **(impact factor 0.92)**
doi: 10.1080/01691864.2017.1421481
- 8 F. Zanlungo, Z. Yücel, D. Bršćić, T. Kanda, N. Hagita
Intrinsic group behaviour: dependence of pedestrian dyad dynamics on principal social and personal features
Plos One 0187253, 2017 **(impact factor 3.54)**
doi: 10.1371/journal.pone.0187253
- 9 F. Zanlungo, T. Kanda
A mesoscopic model for the effect of density on pedestrian group dynamics
Europhysics Letters, Vol. 111, No 3, pp. 38007, 2015 **(impact factor 2.095)**
doi: 10.1209/0295-5075/111/38007

- 10 F. Zanlungo, D. Bršćić, T. Kanda
Spatial-size scaling of pedestrian groups under growing density conditions
Physical Review E Vol. 91 No 6, pp. 062810, 2015 (**impact factor 2.288**)
doi: 10.1103/PhysRevE.91.062810
- 11 M. Shiomi, F. Zanlungo, K. Hayashi , T. Kanda
Towards a Socially Acceptable Collision Avoidance for a Mobile Robot Navigating Among Pedestrians Using a Pedestrian Model
International Journal of Social Robotics, Vol. 6, No 3, pp 443-455, 2014 (**impact factor 1.207**)
doi: 10.1007/s12369-014-0238-y
- 12 F. Zanlungo, T. Ikeda, T. Kanda
Potential for the dynamics of pedestrians in a socially interacting group
Physical Review E Vol. 89, No 1, pp. 012811, 2014 (**impact factor 2.288**)
doi: 10.1103/PhysRevE.89.012811
(Paper chosen as “editor suggestion”, i.e. as being of particular clarity and importance)
- 13 Z. Yücel, F. Zanlungo, T. Ikeda, T. Miyashita, N. Hagita
Deciphering the crowd: Modeling and identification of pedestrian group motion
Sensors, Vol. 13, No. 1, pp. 875-897, 2013 (**impact factor 1.953**)
doi: 10.3390/s130100875
- 14 F. Zanlungo, T. Ikeda, T. Kanda
A microscopic social norm model to obtain realistic macroscopic velocity and density pedestrian distributions
PLoS ONE Vol. 7, No 12, pp. e50720, 2012 (**impact factor 3.73**)
doi: 10.1371/journal.pone.0050720
- 15 F. Zanlungo, T. Ikeda, T. Kanda
Social force model with explicit collision prediction
Europhysics Letters, Vol. 93, No. 6, pp. 68005, 2011 (**impact factor 2.171**)
doi: 10.1209/0295-5075/93/68005
- 16 G. Turchetti, S. Varenti and F. Zanlungo
Asymptotic distribution of global errors in the numerical computations of dynamical systems
Physica A, Vol. 389, No 21, pp. 4994-5006, 2010 (**impact factor 1.521**)
doi: 10.1016/j.physa.2010.06.060
- 17 G. Turchetti, S. Varenti and F. Zanlungo
Relaxation to the asymptotic distribution of global errors due to round off
Europhysics Letters, Vol. 89, No 4, pp. 40006, 2010 (**impact factor 2.753**)
doi: 10.1209/0295-5075/89/40006
- 18 P. Marie, G. Turchetti, S. Varenti and F. Zanlungo
Error distribution in randomly perturbed orbits
Chaos: An Interdisciplinary Journal of Nonlinear Science, Vol. 19, No 4, pp. 043118, 2009 (**impact factor 1.795**)
doi: 10.1063/1.3267510
- 19 F. Zanlungo, T. Arita, S. Rambaldi
Emergence of a traffic flow convention in a multiagent model
Advances in Complex Systems. Vol. 11, No 5, pp. 789-802, 2008

doi: 10.1142/S0219525908001921

- 20 G. Turchetti, F. Zanlungo, B. Giorgini
Dynamics and thermodynamics of a gas of automata
Europhysics Letters, Vol. 78, No 5, pp. 58003, 2007 (**impact factor 2.206**)
doi: 10.1209/0295-5075/78/58003

- 21 F. Zanlungo
A collision avoiding mechanism based on a theory of mind
Advances in Complex Systems. Vol. 10 suppl. No. 2, pp. 363-371, 2007
doi: 10.1142/S0219525907001410

Book chapters

- 22 F. Zanlungo, G. Turchetti, S. Rambaldi
An Automata Based Microscopic Model Inspired by Clonal Expansion
Mathematical Modeling of Biological Systems, Volume II. A. Deutsch et al. (eds.),
Birkhäuser, Boston, pp. 133-144, 2008
doi: 10.1007/978-0-8176-4556-4_12

Conference papers

- 23 F. Zanlungo, C. Feliciani, H. Murakami, Z. Yücel, X. Jia, K. Nishinari, T. Kanda
Density dependence of stripe formation in a cross-flow
International Conference on Traffic and Granular Flow (TGF 2022)
15-17 October 2022, Delhi, India
- 24 A. Gregorj, Z. Yöel, F. Zanlungo, T. Kanda
On the influence of group social interaction on intrusive behaviors
International Conference on Traffic and Granular Flow (TGF 2022)
15-17 October 2022, Delhi, India
- 25 F. Zanlungo, C. Feliciani, Z. Yöel, K. Nishinari, T. Kanda
Crowd congestion number
Pedestrian and Evacuation Dynamics, PED 2021
Dec 2021, Melbourne, Australia
- 26 A. Gregorj, Z. Yöel, F. Zanlungo, C. Feliciani, T. Kanda
On the influence of group social relation on the dynamics of pedestrians outside the group
Pedestrian and Evacuation Dynamics, PED 2021
Dec 2021, Melbourne, Australia
- 27 E. Repiso, F. Zanlungo, T. Kanda, A. Garrell, A. Sanfeliu
People's V-Formation and Side-by-Side Model Adapted to Accompany Groups of People by Social Robots
International Conference on Intelligent Robots and Systems 2019, pp. 2082-2088
Nov 4-8 2019, Macau, China
doi: 10.1109/IROS40897.2019.8968601
- 28 Z. Yücel, F. Zanlungo, T. Kanda
Gender profiling of pedestrian dyads
Traffic and Granular Flow Conference 2019, pp. 299-305
July 2-5 2019, Pamplona, Spain
doi: 10.1007/978-3-030-55973-1_37
- 29 F. Zanlungo, L. Crociani, Z. Yücel, T. Kanda
The effect of social groups on the dynamics of bi-directional pedestrian flow: a numerical study
Traffic and Granular Flow Conference 2019, pp. 307-313
July 2-5 2019, Pamplona, Spain

doi: 10.1007/978-3-030-55973-1_38

- 30 C. Feliciani, F. Zanlungo, K. Nishinari, T. Kanda
Thermodynamics of a gas of pedestrians: Theory and experiment
Pedestrian and Evacuation Conference 2018
Collective Dynamics, Vol 5, pp. 440-447, 2020
Aug 21-24 2018, Lund, Sweden
doi: 10.17815/CD.2020.97
- 31 Z. Yücel, F. Zanlungo, C. Feliciani, T. Kanda
Estimating social relation from trajectories
Pedestrian and Evacuation Conference 2018
Collective Dynamics, Vol 5, pp. 222-229, 2020
Aug 21-24 2018, Lund, Sweden
doi: 10.17815/CD.2020.54
- 32 F. Zanlungo, Z. Yücel, T. Kanda
Social group behaviour of triads. Dependence on purpose and gender
Pedestrian and Evacuation Conference 2018
Collective Dynamics, Vol 5, pp. 118-125, 2020
Aug 21-24 2018, Lund, Sweden
doi: 10.17815/CD.2020.90
- 33 F. Zanlungo, Z. Yücel, F. Ferreri, J. Even, L.Y. Morales Saiki, T. Kanda
Pedestrian models for robot motion
Pedestrian and Evacuation Conference 2018
Collective Dynamics, Vol 5, pp. 525-527, 2020
Aug 21-24 2018, Lund, Sweden
doi: 10.17815/CD.2020.90
- 34 Z. Yücel, F. Zanlungo and M. Shiomi
Walk the talk: Gestures in mobile interaction
International Conference on Social Robotics 2017, pp. 220-230
Nov 22-24 2017, Tsukuba, Japan
doi: 10.1007/978-3-319-70022-9_22
- 35 F. Zanlungo, Z. Yücel, F. Ferreri, J. Even, L.Y. Morales Saiki, T. Kanda
Social group motion in robots
International Conference on Social Robotics 2017, pp. 474-484, Tsukuba, Japan
doi: 10.1007/978-3-319-70022-9_47
- 36 D. Bršćić, F. Zanlungo, T. Kanda
Modelling of Pedestrian groups and application to group recognition
40th International Convention on Information Information and Communication Technology, Electronics and Microelectronics (MIPRO), 2017, pp. 564-569, Opatija, Croatia
doi: 10.23919/MIPRO.2017.7973489
- 37 K. Kamei, F. Zanlungo, T. Kanda, Y. Horikawa, T. Miyashita, N. Hagita
Cloud networked robotics for social robotic services extending robotic functional service standards to support autonomous mobility system in social environments
International Conference on Ubiquitous Robots and Ambient Intelligence (URAI), 2017, pp. 897-902, Jeju, South Korea
doi: 10.1109/URAI.2017.7992862

- 38 F. Zanlungo, Z. Yücel, T. Kanda
The effect of social roles on group behaviour
Pedestrian and Evacuation Conference 2016, pp. 243-249, Hefei, China
doi: 10.17815/CD.2016.11
- 39 F. Zanlungo, D. Bršćić, T. Kanda
Pedestrian group behaviour analysis under different density conditions
Pedestrian and Evacuation Conference 2014, Delft, Netherlands
Transportation Research Procedia Vol. 2, 149-158, 2014
doi: 10.1016/j.trpro.2014.09.020
- 40 D. Bršćić, F. Zanlungo, T. Kanda
Density and velocity patterns during one year of pedestrian tracking
Pedestrian and Evacuation Conference 2014, Delft, Netherlands
Transportation Research Procedia 2, 77-86, 2014
doi: 10.1016/j.trpro.2014.09.011
- 41 F. Zanlungo, T. Kanda
Do walking pedestrians stably interact inside a large group? Analysis of group and sub-group spatial structure
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- 47 A. Bazzani, B. Giorgini, F. Zanlungo and S. Rambaldi
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- 49 F. Zanlungo, A. Bazzani, B. Giorgini, S. Rambaldi, G. Servizi and G. Turchetti
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Other presentations at conferences

- 51 F. Zanlungo, Z. Yücel, F. Ferreri, J. Even, L.Y. Morales Saiki, T. Kanda
Autonomous vehicles moving as a human group
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- 52 F. Zanlungo, G. Turchetti
Dynamics and Thermodynamics of Automata with a visual cone. Comparison with a recursive thinking model
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- 53 F. Zanlungo, G. Turchetti
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- 54 F. Zanlungo, G. Turchetti
Dynamics and thermodynamics of a gas of automata
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- 55 G. Turchetti, F. Zanlungo
Termodinamica di un gas di automi (in Italian)
Italian Workshop in Artificial Life (WIVA2), 2005, Rome, Italy
- 56 G. Turchetti, S. Rambaldi, G. Salustri and F. Zanlungo
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Invited talks

- 57 *Pedestrian models: current state and perspectives*
Kyoto University
Kyoto, Japan, 2019

- 58 *Pedestrian group behaviour*
Kyoto University
Kyoto, Japan, 2019
- 59 *Pedestrian group behaviour*
Alicante University
Alicante, Spain, 2019
- 60 *Pedestrian group behaviour*
Polytechnic University of Catalonia
Barcelona, Spain, 2019
- 61 *Pedestrian group behaviour*
Symposium on Physics and Psychology of Human Crowd Dynamics
Leiden, Netherlands, 2018
- 62 *Pedestrian group behaviour*
Department of Physics of Bologna University
Bologna, Italy, 2018
- 63 *Pedestrian group behaviour*
Linnaeus University
Växjö, Sweden, 2018
- 64 *Pedestrian group behaviour*
University of Milano Bicocca
Milan, Italy, 2017
- 65 *Pedestrian group behaviour*
Tokyo University, Non-linear seminar, Nishinari Laboratory
Tokyo, Japan, 2016
- 66 *Potential for the dynamics of pedestrians in a socially interacting group*
Department of Physics of Bologna University
Bologna, Italy, 2014
- 67 *Potential for the dynamics of pedestrians in a socially interacting group*
Artificial Life Laboratory of Nagoya University (Arita Lab)
Nagoya, Japan, 2014
- 68 *Experimental study and modelisation of pedestrian space occupation and motion pattern in a real world environment*
Department of Physics of Bologna University
Bologna, Italy, 2012
- 69 *Experimental study and modelisation of pedestrian space occupation and motion pattern in a real world environment*
Artificial Life Laboratory of Nagoya University (Arita Lab)
Nagoya, Japan, 2012
- 70 *Social force model with explicit collision prediction*
Artificial Life Laboratory of Nagoya University (Arita Lab)
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| 71 | <i>Evolution of Behaviours in Artificial Life</i>
International Summer School: Interfacing Sciences and Humanities
Rimini, Italy, 2009 |
| 72 | <i>Chaos and Complexity</i>
International Summer School: Interfacing Sciences and Humanities
Rimini, Italy, 2009 |
| 73 | <i>Error statistics in perturbed discrete dynamical systems</i>
Department of Mathematics of Bologna University
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| 74 | <i>Evolutionary techniques in a traffic model</i>
Nagatani Laboratory of Shizuoka University
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Japanese language papers

- 75 林宏太郎、塩見昌裕、Francesco ZANLUNGO、神田崇行
歩行者モデルを用いた話しかけやすい移動行動
日本ロボット学会第32回学術講演会講演論文集RJS2014, 3P2-07, 2014
- 76 池田徹志、児堂義弘、Daniel REA、Francesco ZANLUNGO、塩見昌裕、神田崇行
街角における歩行者のサブゴール遷移モデル
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- 77 塩見昌裕、Francesco ZANLUNGO、林宏太郎、神田崇行
街角で活動する移動ロボットのための歩行者シミュレータ
日本ロボット学会第30回学術講演会講演論文集RJS2012, 2N1-8, 2012
- 78 塩見昌裕、Francesco ZANLUNGO、林宏太郎、神田崇行
歩行者モデルを用いた街角でのロボットナビゲーション
日本ロボット学会第30回学術講演会講演論文集RJS2012, 2N1-8, 2012

Patents

Registered patents

ecvitem1 T. Ikeda, F. Zanlungo,
T. Miyashita, T. Kanda

System for the prediction of pedestrian motion and robot control

(移動予測装置、ロボット制御装置、移動予測プログラムおよび移動予測方法)
Japanese patent 5763384, registered on 19/6/2015

- 2 M. Shiomi, T. Kanda, F. Zanlungo, T. Ikeda
A robot able to predict pedestrian motion and perform automatic collision avoidance
(歩行者の軌跡を予測して自己の回避行動を決定するロボット)
Japanese patent 5768273, registered on 3/7/2015