Personal information

Surname(s) / First name(s)	**Zanlungo Francesco**
Address(es)	700-0927, Okayama-ken, Okayama-shi, Nishi Furu Matsu, 2-11-6, Japan
Telephone(s)	(+81) 0774-95-1561, (+81) 080-4018-2731
Email(s)	zanlungo@atr.jp, francesco.zanlungo@gmail.com
Nationality(-ies)	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

From October 2021	Contract lecturer Okayama University, Okayama, Japan
From April 2021	Lecturer International Professional University of Technology, Osaka, Japan Permanent position
From April 2020	Part time researcher Okayama University, Okayama, Japan Studying the behaviour of pedestrians and robot-pedestrian interactions
April 2017-March 2020	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 *(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.)*
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(s): **Italian**

	Understanding		Speaking		Writing
Self-assessment *European level*(*)	Listening	Reading	Spoken interaction	Spoken production	
English	C2 Proficient user	C2 Proficient user	C2 Proficient user	C2 Proficient user	C2 Proficient user
Japanese(**)	C1 Proficient user	C1 Proficient user	C1 Proficient user	C1 Proficient user	C1 Proficient user
Spanish	C2 Proficient user	C2 Proficient user	C1 Proficient user	C1 Proficient user	C1 Proficient user
Portuguese	C1 Proficient user	C1 Proficient user	B2 Independent user	B2 Independent user	B1 Independent user
French	B2 Independent user	C1 Proficient user	B1 Independent user	B1 Independent user	A2 Basic user
Turkish	A2 Basic user	A2 Basic user	A2 Basic user	A1 Basic user	A2 Basic user
Mandarin Chinese	A1 Basic user	A2 Basic user	A1 Basic user	A1 Basic user	A2 Basic user

(*) *Common European Framework of Reference (CEF) level*

(**) *Holder of first (highest) level of Japanese proficiency, approved in 2008*

External funding

2021 Collaborative researcher in the JSPS Kiban-A 18H04121 project *Research and development for mobile HRI and its interaction design theory* (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 *Teaching "Mechanics" (in Japanese)*
From 2021	Lecturer at the International Professional University of Technology, Osaka, Japan *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)*
In 2018	Contract Lecturer at Okayama University, Okayama, Japan *Teaching "Global Studies II"*
2016-2017 (Appointed, and prepared lecture notes, before resigning)	Applications of Calculus, Partial Differential Equations module, School of Computer Science and Mathematics, Kingston University *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.*
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 *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).*
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 *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.*
2015-2016	Engineering Mathematics and Computing, School of Civil Engineering, Kingston University *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.*
2008-2009	Analytical Mechanics, Instructed by Prof. Turchetti and F. Zanlungo, Dep. of Physics, Bologna University *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.*
2008-2009	Teaching assistant of the Institutions of Mathematics course, Instructed by Prof. Bazzani, Milan Polytechnic University *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.*
2008	Introductory course of Mathematics ("College Algebra"), Milan Polytechnic University *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.*
2007-2008	Teaching assistant of the Numerical Methods course, Instructed by Profs. Turchetti and Bazzani, Master course in Physics, Bologna University

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.

2007-2008

Teaching assistant of the Complex Systems Laboratory course, Instructed by Dr. Giorgini, Dep. of Physics, Bologna University

For this course, I prepared lectures on genetic algorithms, population dynamics (evolutionary game theory) and neural networks.

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 **[12]**.
2. The improvement of the above model by taking in account the asymmetrical shape of human bodies **[19]**, *(work based on data provided by the Nishinari lab. of Tokyo University)*.
3. The development of "Congestion Number", a mathematical tool to asses the state of a human pedestrian crowd **[20]**, *(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 **[11,38]**.
5. Large pedestrian groups are not stable, and usually break up in more stable 2 or 3 pedestrian sub-units **[36]**.
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 **[9]**.
7. Empirical study and mathematical modelling of how crowd density and other environment features affect the behaviour of pedestrians and in particular of groups **[6,7,34,35]**.
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 **[1,2,5,23,26,27,33]**.
9. How gestures affect the behaviour of pedestrian groups **[4,29]**.
10. How the presence of groups affects crowd dynamics **[24]**

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 **[8,22,28,30,39,41]**, and the development of algorithms to automatically detect pedestrian walking goals **[37]** and pedestrian groups **[10,31,40]**.

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 **[13,14,15]**.

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 **[21]**.
2. The relation between the evolution of collision avoidance strategies and the evolution of a *Theory of Mind* **[18,43,44]**.
3. The evolution of "traffic conventions" (such as driving on the left or right side of streets) in a mobility system **[16,45]**.
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 **[17,25]**.

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, 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)**

2 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)**

3 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

4 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

5 F. Zanlungo, Z. Yücel, D. Brščić, 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

6 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

7 F. Zanlungo, D. Brščić, 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

8 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

9 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)

10 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

11 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

12 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

13 G. Turchetti, S. Vaienti 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

14 G. Turchetti, S. Vaienti 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

15 P. Marie, G. Turchetti, S. Vaienti 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

16 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

17 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

18 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

Under review/ In preparation

19 F. Zanlungo, C. Feliciani, Z. Yücel, K. Nishinari, T. Kanda
Analysis and modelling of macroscopic and microscopic dynamics of a pedestrian cross-flow
arXiv:2112.12304

20 F. Zanlungo, C. Feliciani, Z. Yücel, K. Nishinari, T. Kanda
Some considerations on crowd Congestion Level
arXiv:2004.01883

Book chapters

21 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

Peer-reviewed conference papers

22 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

23 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

24 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

25 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

26 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

27 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

28 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

29 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

30 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

31 D. Brščić, 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

32 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

33 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

34 F. Zanlungo, D. Brščić, 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

35 D. Brščić, 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

36 F. Zanlungo, T. Kanda
Do walking pedestrians stabily interact inside a large group? Analysis of group and sub-group spatial structure
The annual meeting of cognitive science society (CogSci) 2013, Vol. 35, No. 35, pp. 3847-3852, Berlin, Germany

37 T. Ikeda, Y. Chigodo, D. Rea, F. Zanlungo, M. Shiomi, T. Kanda
Modeling and Prediction of Pedestrian Behavior based on the Sub-goal Concept
Robotics: Science and Systems (RSS) 2013, pp. 137-144, Sidney, Australia (acceptance rate 33%)
doi: 10.15607/RSS.2012.VIII.018

38 F. Zanlungo, Y. Chigodo, T. Ikeda, T. Kanda
Experimental study and modelling of pedestrian space occupation and motion pattern in a real world environment
Pedestrian and Evacuation Dynamics 2012, Zurich, Switzerland
Weidmann et al. (eds.), pp. 289-304, Springer, (published as a book in 2014)
doi: 10.1007/978-3-319-02447-9_24

39 M. Shiomi, F. Zanlungo, K. Hayashi, T. Kanda
A Framework with a Pedestrian Simulator for Deploying Robots into a Real Environment
International Conference on Simulation, Modeling, and Programming for Autonomous Robots 2012 (SIMPAR), pp. 185-196, (acceptance rate 35%)
doi: 10.1007/978-3-642-34327-8_19

40 Z. Yücel, F. Zanlungo, T. Ikeda, T. Miyashita, N. Hagita
Modeling Indicators of Coherent Motion
International Conference on Intelligent Robots and Systems (IROS) 2012, pp 2134–2140, Algarve, Portugal (acceptance rate 39%) 2012
doi: 10.1109/IROS.2012.6385744

41 M. D. Cooney, F. Zanlungo, S. Nishio, H. Ishiguro
Designing a Flying Humanoid Robot (FHR): Effects of Flight on Interactive Communication
International Symposium on Robot and Human Interactive Communication (IEEE RO-MAN) 2012, pp. 364-371, 2012, Paris, France
doi: 10.1109/ROMAN.2012.6343780

42 A. Bazzani, B. Giorgini, F. Zanlungo and S. Rambaldi
Cognitive Dynamics in an automata gas
Artificial Life and Evolutionary Computation, pp. 3-19, Wivace 2008, Venice, Italy
doi: 10.1142/9789814287456_0001

43 F. Zanlungo
Evolution of high level recursive thinking in a collision avoiding agent model
Artificial Life and Evolutionary Computation, pp. 155-164, Wivace 2008, Venice, Italy
doi: 10.1142/9789814287456_0014

44 F. Zanlungo, A. Bazzani, B. Giorgini, S. Rambaldi, G. Servizi and G. Turchetti
An evolutionary crowd dynamics model
European Conference on Complex Systems 2007, Dresden Germany

45 F. Zanlungo, T. Arita
Evolutionary Simulation of an Agent Based Mobility System Using Indirect Communication
International Symposium of Artificial Life and Robotics (A-Life) 2006, pp. 319-322, Oita, Japan

Other presentations at conferences

46 F. Zanlungo, Z. Yücel, F. Ferreri, J. Even, L.Y. Morales Saiki, T. Kanda
Autonomous vehicles moving as a human group
Poster presentation at IROS 2017

47 F. Zanlungo, G. Turchetti
Dynamics and Thermodynamics of Automata with a visual cone. Comparison with a recursive thinking model
Dynamics and Thermodynamics of Systems with Long Range Interactions: Theory and Experiments, 2007

48 F. Zanlungo, G. Turchetti
An evolutionary collision avoiding model based on the theory of mind
International Conference on the Simulation of adaptive behavior (SAB) 2006, Rome, Italy

49 F. Zanlungo, G. Turchetti
Dynamics and thermodynamics of a gas of automata
Italian Workshop in Artificial Life (WIVA3), 2006

50 G. Turchetti, F. Zanlungo
Termodinamica di un gas di automi (in Italian)
Italian Workshop in Artificial Life (WIVA2), 2005, Rome, Italy

51 G. Turchetti, S. Rambaldi, G. Salustri and F. Zanlungo
Mathematical models of clonal expansion
WSEAS Transactions on Biology and Biomedicine 1, 373-378, 2004

Invited talks

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

53 *Pedestrian group behaviour*
Kyoto University
Kyoto, Japan, 2019

54 *Pedestrian group behaviour*
Alicante University
Alicante, Spain, 2019

55 *Pedestrian group behaviour*
Polythechnic University of Catalonia
Barcelona, Spain, 2019

56 *Pedestrian group behaviour*
Symposium on Physics and Psychology of Human Crowd Dynamics
Leiden, Netherlands, 2018

57 *Pedestrian group behaviour*
Department of Physics of Bologna University
Bologna, Italy, 2018

58 *Pedestrian group behaviour*
Linnaeus University
Växjö, Sweden, 2018

59 *Pedestrian group behaviour*
University of Milano Bicocca
Milan, Italy, 2017

60 *Pedestrian group behaviour*
Tokyo University, Non-linear seminar, Nishinari Laboratory
Tokyo, Japan, 2016

61 *Potential for the dynamics of pedestrians in a socially interacting group*
Department of Physics of Bologna University
Bologna, Italy, 2014

62 *Potential for the dynamics of pedestrians in a socially interacting group*
Artificial Life Laboratory of Nagoya University (Arita Lab)
Nagoya, Japan, 2014

63 *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

64 *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

65 *Social force model with explicit collision prediction*
Artificial Life Laboratory of Nagoya University (Arita Lab)
Nagoya, Japan, 2011

66 *Evolution of Behaviours in Artificial Life*
International Summer School: Interfacing Sciences and Humanities
Rimini, Italy, 2009

67 *Chaos and Complexity*
International Summer School: Interfacing Sciences and Humanities
Rimini, Italy, 2009

68 *Error statistics in perturbed discrete dynamical systems*
Department of Mathematics of Bologna University
Bologna, Italy, 2009

69 *Evolutionary techniques in a traffic model*
Nagatani Laboratory of Shizuoka University
Hamamatsu, Japan, 2008

Japanese language papers

70 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

71 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
日本ロボット学会第３1回学術講演会講演論文集RJS2013, 3I2-03, 2013

72 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第30回学術講演会講演論文集RJS2012, 2N1-8, 2012

73 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第30回学術講演会講演論文集RJS2012, 2N1-8, 2012

Patents

Registered patents

ecvitem1T. 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