



9th IFAC Conference MIM 2019
on Manufacturing Modeling, Management, and Control

FINAL SCIENTIFIC REPORT

IFAC MIM 2019



Hochschule für
Wirtschaft und Recht Berlin
Berlin School of Economics and Law





Organizers and Sponsors

- Main Sponsor: IFAC (International Federation of Automatic Control)
- IFAC TC 5.2 Manufacturing Modelling for Management and Control

IFAC Technical Committee(s) Co-Sponsor:

- TC 1.3 Discrete Event and Hybrid Systems
- TC 3.2 Computational Intelligence in Control
- TC 4.3 Robotics
- TC 5.1 Manufacturing Plant Control
- TC 5.3 Enterprise Integration and Networking
- TC 5.4 Large Scale Complex Systems
- TC 7.4 Transportation systems
- TC 9.1 Economic, Business, and Financial Systems

IEEE Technical Committee Co-Sponsor:

- SMCS TC Cyber-Physical Cloud Systems

IFIP Technical Committee Co-Sponsor:

- WG 5.7 Advances in Production Management Systems



Hochschule für
Wirtschaft und Recht Berlin
Berlin School of Economics and Law





Scientific Committees

Chair International Program Committee

Professor
Alexandre
Dolgui (France)



General Conference Chair

Professor
Dmitry
Ivanov
(Germany)



International Program Committee

International Program Committee (IPC)

IPC members

El-Houssaine Aghezzaf (BE)
Hassane Alla (FR)
Lionel Amodeo (FR)
Ronald Askin (US)
Zbigniew Banaszak (PL)
Natalia Bakhtadze (RU)
Jonathan F. Bard (US)
John J. Bartholdi (US)
Olga Battaia (FR)
Daria Battini (IT)
Wilhelm Bauer (DE)
Lyes Benyoucef (FR)
Bopaya Bidanda (US)
Neila Bhouri (FR)
Sergio Cavalieri (IT)
Felix T.S. Chan (HK)
Long Chen (MO)
Tsan-Ming Choi (HK)
Feng Chu (FR)
Ajay Das (US)
Joshua Dayan (ISR)
Xavier Delorme (FR)

Stephen Disney (UK)
Alexandre Dolgui (FR)
Peter Fleming (UK)
Enzo Morosini Frazzon (BR)
Michael Freitag (DE)
Stanley Gershwin (US)
Christoph Glock (DE)
Kannan Govindan (DK)
Bernard Grabot (FR)
Robert Grubbström (SE)
Oleg Gusikhin (US)
Dmitry Ivanov (DE)
Zhibin Jiang (CN)
Richard Hartl (AT)
Sandra Hirche (DE)
Dimitris Kiritsis (CH)
Chien-Ho Ko (TW)
Ton de Kok (NL)
Holger Kohl (DE)
Mikhail Kovalyov (BY)
Andrew Kusiak (US)
Yuri Levin (CA)
Eva Navarro Lopez (UK)

Marco Macchi (IT)
Semyon M. Meerkov (US)
Stefan Minner (DE)
Laszlo Monostori (HU)
Helena Navas (PT)
Andrew Nee (SG)
Mariana Netto (FR)
Shimon Y. Nof (US)
Hervé Panetto (FR)
Kriengsak Panuwatwanich (AU)
Anatoly Pashkevich (FR)
Erwin Pesch (DE)
Christian Prins (FR)
Jean-Marie Proth (FR)
Nidhal Rezg (FR)
Antonio Barros Ruano (PT)
Zaki Sari (DZ)
Boris Sokolov (RU)
Jörn Schönberger (DE)
Frank Schultmann (DE)
Suresh P. Sethi (US)
Fabio Sgarbossa (IT)
David Simchi-Levi (US)

Alexander Smirnov (RU)
Thomas Spengler (DE)
Sarah Spurgeon (UK)
Kathryn Stecke (US)
Gabor Sziebig (NO)
Marco Taisch (IT)
Manoj Tiwari (IN)
Tullio Tolio (IT)
Marcos de Sales Guerra Tsuzuki (BR)
Francois Vernadat (LU)
Agostino Villa (IT)
Stefan Voss (DE)
Lin Wang (CN)
Georg Weichart (AT)
Frank Werner (DE)
Wilhelm Wilbert (US)
Dash Wu (CA)
Xiolan Xie (FR)
Alice Yalaoui (FR)
Farouk Yalaoui (FR)
Candace A. Yano (US)
Janan Zaytoon (FR)
Noureddine Zerhouni (FR)

91 members from 30 countries

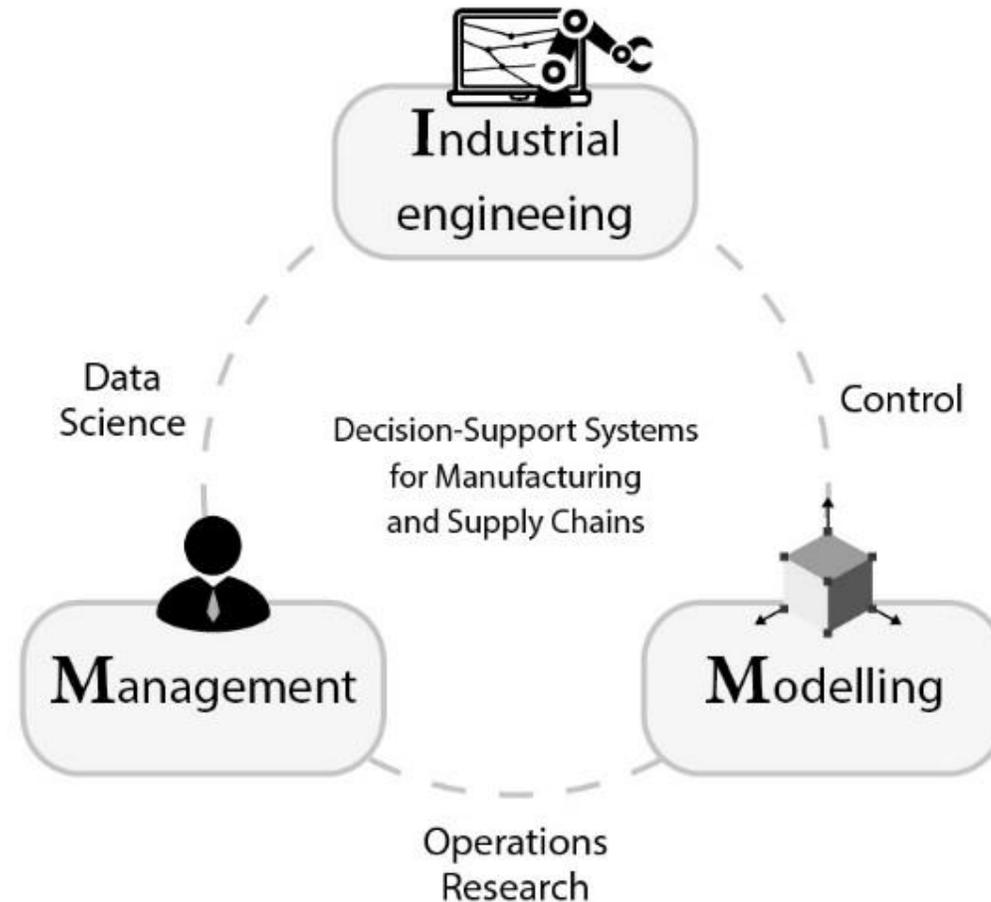


Scientific Program

Unique feature of MIM 2019 Conference: **Multi-Disciplinarity**

MIM 2019 Mission:

Connect Control, Industrial Engineering, OR and Computer Science for better management decision-support systems in digital, resilient and sustainable manufacturing and supply chains in the era of Industry 4.0

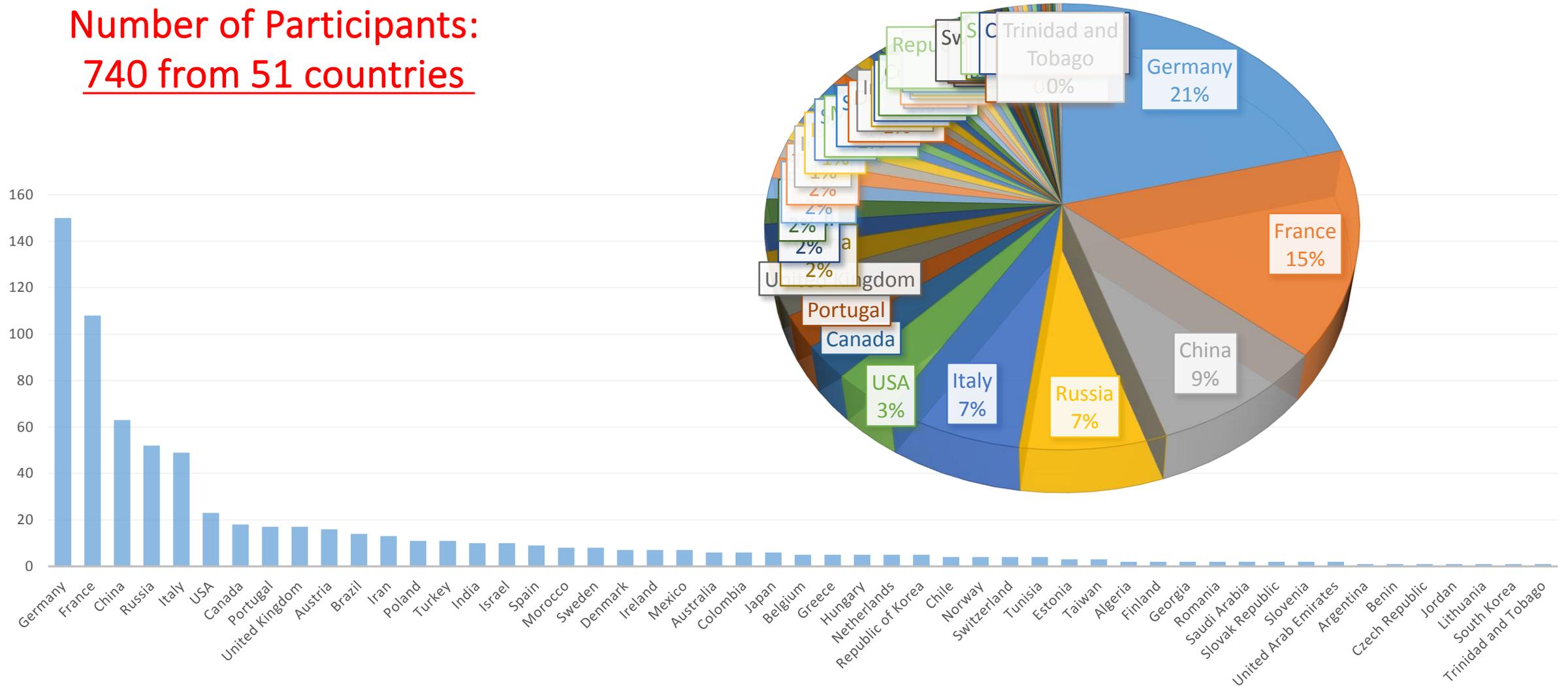


The central theme of the 9th MIM 2019 is **Digital, Resilient and Sustainable Manufacturing 4.0**



Participants MIM 2019

**Number of Participants:
740 from 51 countries**



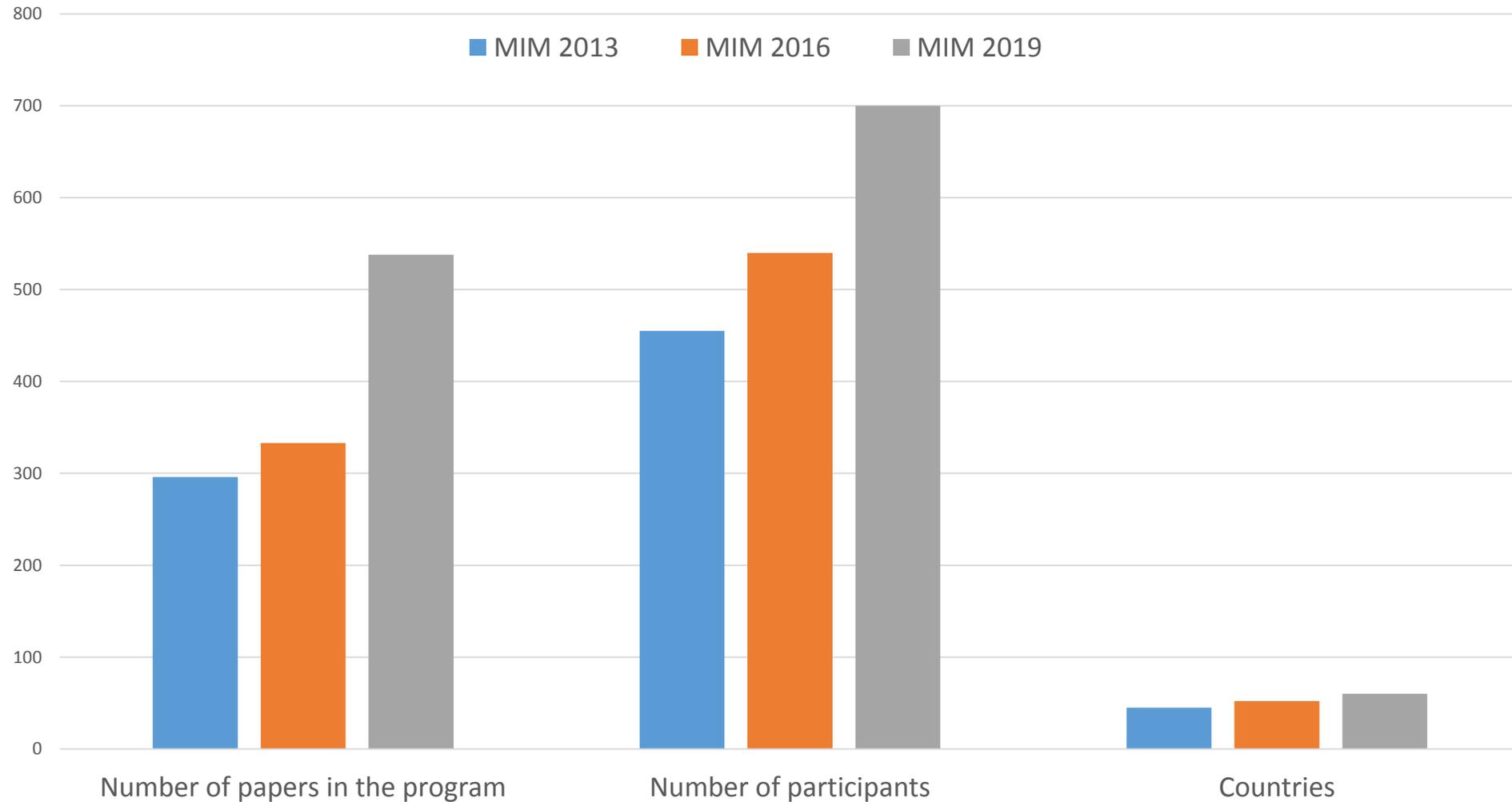
Scientific Program

Number of submissions	870+ from 69 countries
Number of Track and Session Proposals	100
Accepted submissions	578
Acceptance rate	64.3%
Number of presentations	550+
Number of sessions	130+
Number of authors	1427 from 60 countries
Number of reviewers	700+ reviewers
Number of participants	740 from 51 countries



The biggest MIM ever

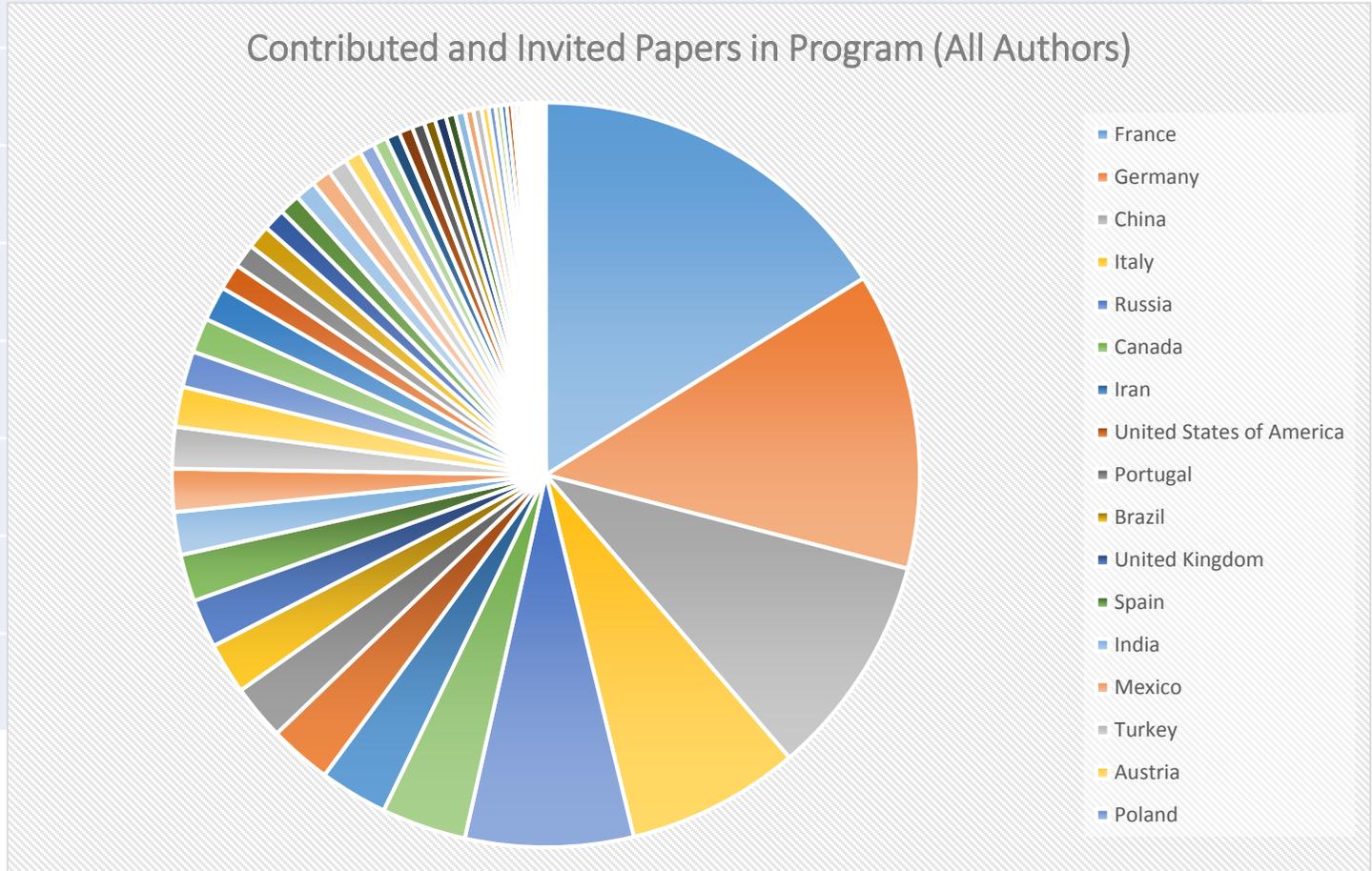
MIM development in recent years





Papers in the program – authors from 60 countries

Country	Contributed and Invited Papers in Program (All Authors)
France	269
Germany	215
China	161
Italy	125
Russia	121
Canada	61
Iran	49
United States of America	45





Conference Schedule

DAY 1 - August 28 - Wed			
8:00-17:00	Registration		
9:00-9:45	Opening session		
09:45-10:30	Plenary session I		
10:30-11:00	Coffee break		
11:00-12:30	Technical Sessions	SupplyOn Workshop	
12:30-13:30	Lunch		
13:30-15:00	Plenary sessions II and III		
15:00-15:30	Coffee break		
15:30-17:20	Technical Sessions	anyLogistix Workshop	Doctoral Workshop
19:00-23:30	Boat Trip		
DAY 2 - August 29 - Thu			
8:30-10:20	Technical Sessions	Meet the Editors (starts at 9:00 AM)	
10:30-11:00	Coffee break		
11:00-11:45	Plenary sessions IV and V		
12:30-13:30	Lunch		
13:30-14:15	Plenary sessions VI and VII		
15:00-15:30	Coffee break		
15:30-17:20	Technical Sessions	TC 5.2 Meeting (by invitation only)	
19:00-23:30	Gala Dinner		
DAY 3 - 30.08 - Fri			
8:30-10:20	Technical Sessions	Track Keynotes I and II (starts at 8:45 AM)	
10:30-11:00	Coffee break		
11:00-12:30	Technical Sessions	Track Keynotes III and IV	AnyLogic Workshop
12:30-13:30	Lunch		
13:30-15:00	Technical Sessions	Track Keynotes V and VI	IJPR EB Meeting (by invitation only)
15:00-15:30	Coffee break		
15:30-17:20	Technical Sessions		IJISM EB Meeting (by invitation only)
17:30-18:30	Closing ceremony		



7 Plenaries

- Richard HARTL *“Solution approaches and incentive schemes in collaborative logistics planning”*
- Lenny KOH *“What really matters today and in the future – From physical to digital to autonomous”*
- Holger KOHL *“Modular Shopfloor-IT – Intelligent Process Management of Customer-Specific Products”*
- Andreas OROSZI *“Digitalization at Festo – Our way in digital transformation”*
- Boris SOKOLOV *“Planning and scheduling by optimal control: fundamentals and applications to cyber-physical and Industry 4.0 systems”*
- Srinivas (Sri) TALLURI *“Models for Evaluating and Monitoring Efficiency of Supply Chain Network Designs”*
- Christopher TANG *“Supply Chain Operations in the Industry 4.0 Era”*





5 Keynotes

- **Cihan H. Dagli “Meta-Architectures for Cyber Manufacturing”**
- **Dorit S. Hochbaum “Adjacency-Clustering for Yield Prediction in Integrated Circuit Manufacturing”**
- **Erwin Pesch “Conflict-Free Yard Crane Routing in an Automated Container Terminal”**
- **Subhash C. Sarin “Lot Streaming”**
- **Manoj K. Tiwari “Manufacturing Analytics”**





Meet the Editors

Constantin Blome (IJOPM, EiC)
Alexandre Dolgui (IJPR, EiC)
Laszlo Monostori (CIRP Journal, EiC)

Thu., August 29, 9:00 – 10:20 AM; Audimax



121 Technical Sessions



Photo: Oana Popa-Costea





Social Program



**Gala-Dinner in
the heart of
Berlin at bcc
(Alexanderplatz)**
August 29, 7:00 PM



Boat Trip
August 28, 7:00 PM



Industrial Tours

Fraunhofer IPK: Industry 4.0 solutions in manufacturing

Stadler: Digitalization in rail manufacturing

BMW

Rolls Royce

Siemens





Industrial Workshops

**anyLogistix Supply Chain Simulation and Optimization
for Industry 4.0 and the Digital Transformation**

**SupplyOn: Big Data Analytics in Supply Chain Management:
Practical Insights in Aerospace Supplier Collaboration**

**The AnyLogic Material Handling Library for
New Disruptive Technologies of Industry 4.0**





Conference Cloud Platform InfoVaya

<https://events.infovaya.com/event?id=31>

If you have registered for MIM 2019, you can login after you set your own password at <https://events.infovaya.com/register>

The screenshot shows a web browser displaying the event page for MIM 2019. The browser's address bar shows the URL <https://events.infovaya.com/event?id=31>. The page features the InfoVaya logo at the top, which includes an owl icon. Below the logo, there are navigation links for "Log in" and "Contact Us". The main content area is titled "MIM 2019 Summary" and contains a large graphic with the text "2019" and "mim" in a stylized font, with a silhouette of a city skyline below it. To the right of the graphic, the event details are listed: "9th IFAC/IFIP/IFORS/IISE/INFORMS Conference on Manufacturing Modelling, Management and Control", "August 28th 2019 - August 30th 2019", and "Berlin School of Economics and Law / Lichtenberg Campus - Berlin, GERMANY". There are also links for "Event Website", "Committee Webpage", and "Venue Website". At the bottom of the page, there is a "Summary" section with a document icon, containing the text: "Digitalization, resilience, and sustainability shape current and future trends in manufacturing modelling, management, and control. The aim of MIM 2019 is to bring together researchers and practitioners in industrial".



Post-Conference Proceedings

→ ↻ 🏠 <https://www.sciencedirect.com/journal/ifac-papersonline/vol/52/issue/13> ⌵ ⋮ 🏠

 ScienceDirect

 IFAC-PapersOnLine

Latest issue Article collections All issues

[Search in this journal](#)

9th IFAC Conference on Manufacturing Modelling, Management and Control MIM 2019

Berlin, Germany, 28–30 August 2019

Edited by Dmitry Ivanov, Alexandre Dolgui, Farouk Yalaoui

Volume 52, Issue 13,

Pages 1-2838 (2019)

All full papers presented
are in Open Access in IFAC
PapersOnLine Series by
Elsevier (Vol. 52(13))

478 Full Papers published

2838 pages in total



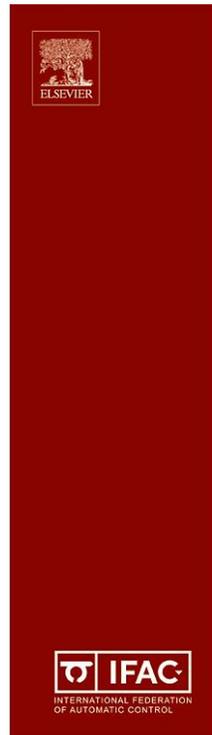
Post-Conference Publications



Volume 51 • Issue 32 • 2018 ISSN 2405-8963

IFAC Papers
Online
CONFERENCE PAPER ARCHIVE

Available online at www.sciencedirect.com
ScienceDirect



Volume 46 • 2018 ISSN 1367-5788

Annual
Reviews in
Control

www.elsevier.com/locate/arcontrol



Volume 6 • 30 December 2018 ISSN 2468-6018

IFAC Journal of
Systems and Control

<https://www.elsevier.com/locate/ifacsc>



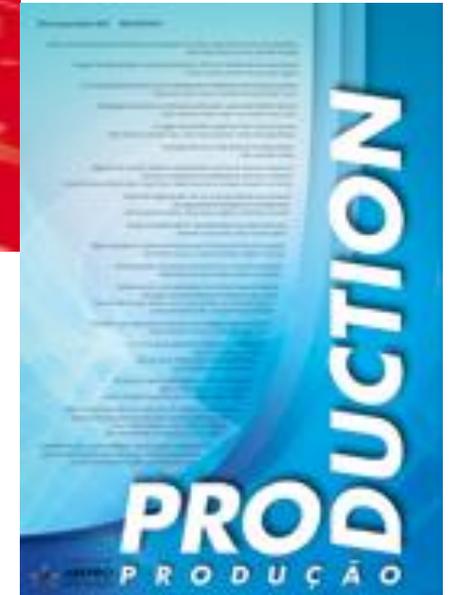
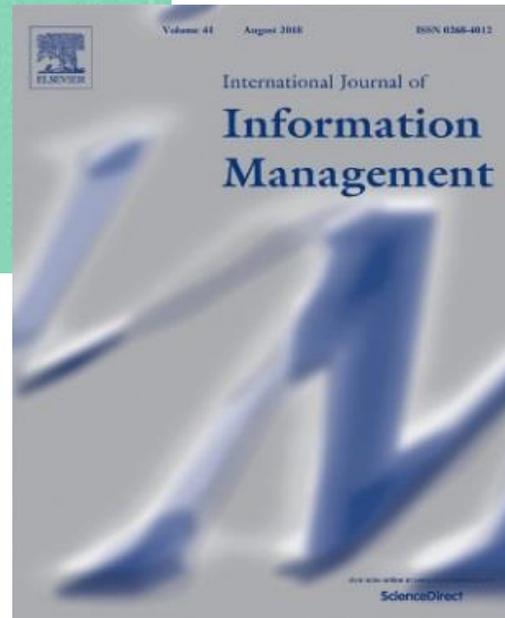
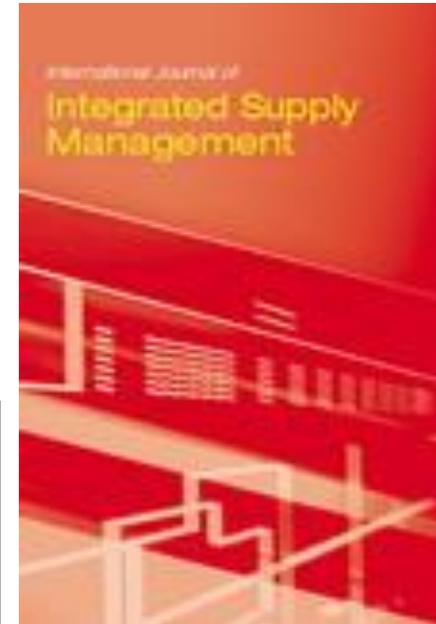
Volume 82 • January 2019 ISSN 0967-0661

Control
Engineering
Practice

www.elsevier.com/locate/conengprac



Post-Conference Special Issues





Awards

Best Paper Award

IFAC Young Author Award

Best Industrial Paper Award

Commended Paper Awards



Photo: Oana Popa-Costea



Commended Paper Awards

Liu, Ming; Liu, Xin	Machine Scheduling with Stochastic Release and Processing Times under Industry 4.0
Ma, Shigui; He, Yong; Yu, Yanan; Gu, Ran; Lyu, Hongjiang	Co-op advertising in a dynamic supply chain when supply is disrupted
Bocewicz, Grzegorz; Nielsen, Izabela; Banaszak, Zbigniew	A Decision Support Model for Prototyping In-Plant Milk-Run Traffic Systems
Rummukainen, Hannu; Nurminen, Jukka K.	Practical Reinforcement Learning - Experiences in Lot Scheduling Application
Mezzogori, Davide; Romagnoli, Giovanni; Zammori, Francesco	Deep Learning and WLC: How to Set Realistic Delivery Dates in High-Variety Manufacturing Systems
Cestana, Alessandro; Pastore, Erica; Alfieri, Arianna; Matta, Andrea	Reducing Resupply Time with Additive Manufacturing in Spare Part Supply Chain
Borstell, Hagen; Reggelin, Tobias	Towards Virtual Commissioning of Image-Based Information Systems for State Detection in Logistics



Commended Paper Awards

Couzon, Paulin; OUAZENE, Yassine; Yalaoui, Farouk	Joint Pricing and Lot-Sizing Problem with Variable Capacity
Weckenborg, Christian; Spengler, Thomas S.	Assembly Line Balancing with Collaborative Robots under consideration of Ergonomics: a cost-oriented approach
Wu, Tong; Kemper, Maximilian; Stemmler, Sebastian; Abel, Dirk; Gries, Thomas	Model Predictive Control of the Weft Insertion in Air-Jet Weaving
Shen, Bin; Li, Qingying	Green Technology Adoption in Textile Supply Chains with Environmental Taxes: Production, Pricing, and Competition
Disney, Stephen; Ponte, Borja; Wang, Xun	The Nonlinear Dynamics of Order-Up-To Inventory Systems with Lost Sales
Achram, Larry; Alavian, Pooya; Eun, Yongssoon; Meerkov, Semyon M.; Zhang, Liang	Programmable Manufacturing Advisor for Smart Production Systems: Architecture, Analytics, Software, and Performance Demonstration
Tavakoli Kafiabad, Shayan; Kazemi Zanjani, Masoumeh; Nourelfath, Mustapha	Integrated Workforce Training and Operations Planning for Maintenance Service Providers



Commended Paper Awards

Vespoli, Silvestro; Grassi, Andrea; Guizzi, Guido; Santillo, Liberatina Carmela	Evaluating the Advantages of a Novel Decentralised Scheduling Approach in the Industry 4.0 and Cloud Manufacturing Era
Lucker, Florian	Using Inventory to Mitigate the Ripple Effect
Klimchik, Alexandr; Pashkevich, Anatol; Chablat, Damien	Stiffness Modelling of NAVARO II Transmission System
Singh, Sube; Barde, Ankit; Mahanty, Biswajit; Tiwari, Manoj K	Digital Twin Driven Inclusive Manufacturing Using Emerging Technologies
Fontana Granotto, Giovanni; Sgarbossa, Fabio; Glock, Christoph; Grosse, Eric	The effect of worker fatigue on the performance of a bucket brigade order picking system
Ait Alla, Abderrahim; Kreutz, Markus; Rippel, Daniel; Lütjen, Michael; Freitag, Michael	Simulation-Based Analysis of the Interaction of a Physical and a Digital Twin in a Cyber-Physical Production System
Caputo, Antonio Casimiro; Pelagagge, Pacifico Marcello; Salini, Paolo	A Methodology to Estimate Resilience of Manufacturing Plants

Best Industrial Paper Awards

Hofmann, Wladimir; Branding, Fredrik

have obtained the Best Industrial Paper Award of IFAC MIM 2019 Conference for the paper

“Implementation of an IoT and Cloud-Based Digital Twin for Real-Time Decision Support in Port Operations”

Moetz, André; Stylos-Duesmann, Philipp; Otto, Boris

have obtained the Best Industrial Paper Award of IFAC MIM 2019 Conference for the paper

“Schedule Instability in Automotive Production Networks: The Development of a Network-Oriented Resequencing Method”



Photo: Oana Popa-Costea



IFAC Young Author Award Finalists

Serena Finco & Mohammed-Amine Abdous

for the paper entitled *Assembly Line Design with Tools Vibration*

co-authored by **Daria Battini, Martina Calzavara, Xavier Delorme**

Elluri Vignan Gupta

for the paper entitled *Optimal Control of Production and Maintenance Operations in Smart Custom Manufacturing Systems with Multiple Machines*

co-authored by **Dnyaneshwar Mogale and Manoj K. Tiwari**

Guangchen Wang

for the paper entitled *A Multi-Objective Whale Swarm Algorithm for Energy-Efficient Distributed Permutation Flow Shop Scheduling Problem with Sequence Dependent Setup Times*

co-authored by **Xinyu Li, Liang Gao, and Peigen Li**



Best Paper Award

Hongyan Dai, Jiawei Tao, Hai Jiang, Weiwei Chen

have obtained the Best Paper Award of IFAC MIM 2019 Conference for the paper

“O2O On-Demand Delivery Optimization with Mixed Driver Forces”

presented at IFAC MIM 2019 at Berlin School of Economics and Law, Germany



Photo: Oana Popa-Costea



Conclusion

“Thank you very much for everything and the fantastic hospitality. I think the conference was a great success! I really enjoyed the sessions and all the other events.”

Prof. Srinivas (Sri) Talluri, Michigan State University, USA

“I would like to congratulate you for the organisation of the extremely successful MIM 2019!”

Prof. Laszlo Monostori, Hungary Academy of Science

“Congratulations and thanks for the very excellent organization of the conference. The social activities have been simply great from the welcome reception to the very final dinner”.

Prof. Fabio Sgarbossa, NTNU, Trondheim, Norway

„It was a wonderful and an excellent organisation of the conference. Simply amazing. In true sense it was a grand success.”

Prof. Manoj Tiwari, IIT Kharagpur, India

“Congratulations! It was a great conference, in all aspects.”

Prof. Enzo Morosini Frazzon, UFSC, Florianapolis, Brasil

“Congratulations with an exceptionally organized conference!”

Prof. Semyon Meerkov, Michigan State University, USA

“I very much enjoyed the conference and your hospitality”.

Prof. Cihan Dagli, Missouri S&T, USA

“Thank you very much for the great organization of the conference. It was managed very efficiently and it collected very high quality papers.”

Dr Francesco Pilati, University of Bologna, Italy



Conclusion

“It seems you gathered all top supply chain expertise and scholars around the world.”

Dr. Mohsen Hosseini, University of Mississippi, USA

“With the 9th IFAC MIM conference at your Berlin Campus, you posted a magnificent achievement! Congratulations on the great success of the Conference. A rare sight of meticulously planned and executed itineraries and high quality paper presentations. It was also a good networking event.”

Prof. Vandana Sonwaney, Symbiosis International University, India

“It was a fantastic experience in Berlin and the MIM 2019! Congratulations on the big success of the conference.”

Prof. Weiwei Chen, Rutgers University, USA

“It was a great conference!! Great speakers, great technical sessions, great organization... definitely, it was an amazing experience! Thanks a lot!”

Prof. Daniel Rossit, Universidad Nacional del Sur, Argentina

“Excellent MIM2019 in Berlin and many congratulations.”

Prof. Lenny Koh, Sheffield University, UK

“Your conference was a success from all points of view. I thank you very much for your work in putting together such a nice event.”

Prof. Mozart Menezes, NEOMA Business School, France



Conclusion

“Many thanks for the excellent organisation of the conference. I really enjoyed the sessions I have attended and the keynote presentations.”

Dr. Yingli Wang, Cardiff Business School, UK

“It was a fantastic conference. Thank you and other organizing committee members very much for organizing such a great conference.”

Prof. Guoqing Zhang, University of Windsor, Canada

“I thank you for the wonderful event of the 9. IFAC-MIM 2019, which took place last week in Berlin. During the conference I had the opportunity to network with interesting people and I had listen important presentations according my work. The organisation of the conference was very successful and last but not least the food was every day of very good quality and has been delicious!”

Mr. Panagiotis Kilimis, BTU Cottbus-Senftenberg, Germany

“I highly enjoyed the conference. It was a blast for me!”

Mr. Nicolas Jathe, BIBA, University of Bremen, Germany

“Thank you very much for the invitation to High Ranking Conference! Everything was at the top. My congratulations.”

Mr. Dmitri Muravev, PhD Student, Shanghai Jiao Tong University, China

MIM 2019 in the Press

HWR Berlin Web Site: <https://www.hwr-berlin.de/en/news/neuigkeiten/news-detail/1001-positive-bilanz-der-internationalen-konferenz-ifac-mim-2019/>

Chris Tang blog: <https://www.linkedin.com/pulse/plenary-talk-industry-40-mim-2109-conference-berlin-christopher-tang/?published=t>

Arvid Holzwarth blog: <https://www.supplyon.com/en/blog/manufacturing-40-how-supplyon-contributed-to-mim-2019/>



Photo: Oana Popa-Costea