

# Salman NAZIR

Postdoc,  
Chemical Engineering Department,  
Politecnico di Milano,  
Piazza Leonardo da Vinci, 32  
20133 MILAN (MI) - Italy  
**Email:** salman.nazir@polimi.it  
**Cell number:** +393312100171



## Research Interests

- Process Safety
- Human Factors
- Situation Awareness (SA)
- Distributed Situation Awareness (DSA)
- Automated Performance Assessment
- Abnormal Situation Management
- Key Performance Indicators (KPIs) and Operator performance indicators (OPIs)
- KPIs and OPIs for measurement of SA and DSA
- Training Methods
- Performance Management
- Performance Evaluation/Assessment
- Design of Experiment
- Impact of Training Methods on Performance
- Operator Training Simulator
- Virtual and Augmented Virtual Environments
- Analytical Hierarchy Approach (AHP)
- Industrial Accidents and their Mitigation
- Immersive Environment, Spatial Learning
- Risk Analysis

## Projects, Awards and Achievements (selective)

- Achieved Cum Laude (highest honor) for the PhD title
- Invited guest speaker (entitle: Advances in Training Methods and Assessment procedures for industrial operators) at Buskerud and Vestfold University College, Norway (August, 2013)
- Invited guest speaker at University of Duisburg-Essen, Germany (entitle: Impact of Training on Operator Performance) (September, 2013)
- Designed and conducted an experiment to determine the effectiveness of different types of training methods and proposed novelty in training and assessment method for process industry
- Adapted models for Situation Awareness (SA) and identified relevant factors influencing SA for the operators of process industry
- Contributed in development of the simulated virtual/3D model of a refinery section of the process industry (from both process engineering and operator training perspective)
- Developed Key Performance Indicators and Operator Performance Indicators for industrial processes, training evaluations and performance assessment
- Developed and conducted an experiment to investigate the impact of training on a chemical operation i.e. the catalyst injection in polymerization processes
- Invited guest speakers at the international symposium in Ghulam Ishaq Khan Institute of information and technology, Islamabad (June, 2010)
- Qualified for a prodigious scholarship for masters in Chemical Engineering from South Korea (2007 – 2009)
- Awarded with merit scholarship by Hanyang University, South Korea (2008)

- Selected for attending 18th (July, 2007) & 19th (July, 2008) International Youth Forum held in Seoul, South Korea
- Editor of e-Newsletter of Chemical Engineering department, COMSATS, Lahore, (2010 to 2011)
- Ranked in top 5 positions among 106 students in bachelors at NFC-IET, Pakistan (2006)
- Attained 2nd position in first professional of Bachelors of Engineering at NFC-IET, Multan, Pakistan (2002)
- Declared as best debater in various debate competitions in high school (Multan Gems School, 1999)

### Academic Qualifications

- 2014 – till present Postdoc at PSE-Lab at Department of Industrial Chemistry and Chemical Engineering
- 2011 – 2013 PhD in Industrial Chemistry and Chemical Engineering (with cum laude/honors, 10-03-2014), Politecnico di Milano, Italy  
Title of thesis: *Improving Industrial Safety by Novel Training and Assessment Methods*  
Committee: Prof. Davide Manca (*Italy*), Prof. Annette Kluge (*Germany*), Prof. Kjell Øvergård (*Norway*)
- 2007 – 2009 Masters in Chemical Engineering, Hanyang University, South Korea  
CGPA 4.06/4.5 (Grade A). Specialization Process Systems Engg.  
Title of thesis: *Development of model using Artificial Neural Network for the prediction of Intrinsic Viscosity of PET manufactured through SSP process*
- 2002 – 2006 B.Sc. in Chemical Engineering, Bahuddin Zakariya University, Multan, Pakistan (ranked in top 5)

### Experience

- Research grant (Assegno di ricerca) under the supervision of prof. Davide Manca, Chemical engineering department, Politecnico di Milano (June, 2014 – till present)
- Visiting researcher at Department of Computer Science and Cognitive Science, University of Duisburg-Essen (September to October, 2013)
- Visiting researcher at Department of Maritime Technology and Innovation (Human Factors research group), Buskerud and Vestfold University College (July to August, 2013)
- Research grant (Assegno di ricerca) under the supervision of prof. Davide Manca, Chemical engineering department, Politecnico di Milano (March to September, 2011)
- Research grant (Assegno di ricerca) under the supervision of prof., Davide Manca, Chemical engineering department, Politecnico di Milano (July 2013 till July 2014)
- Lecturer (teaching assistant) for the laboratory lessons and exercises for courses Instrumentation and Process Control of Chemical Plants and Process Systems Engineering (2011 to present)
- Lecturer/researcher in chemical engineering department of a growing university named COMSATS Institute of Information Technology, Pakistan (2009 - 2011)
  - Teaching Simultaneous Heat and Mass Transfer. Use MATLAB and HYSYS for some examples.
  - Course (program) coordinator.
  - Departmental Newsletter in charge.
- Research work experience in Process Systems Engineering laboratory as a graduate student in Hanyang University, South Korea (2007 - 2009).
- Part time teaching experience (private) of English, where I was responsible for the coaching of IELTS and for speaking, writing and presentation skills

## Technical Skills

- MATLAB, HYSYS (Aspen), Sigmaplot, Paraview, EndNote, MS Word, Excel, Visio, PowerPoint, SPSS, R, Analytic Hierarchy Process, Scientific writing

## Language Skills

- Excellent proficiency in English with effective technical and research writing skills. IELTS =7.5 (test taken in October, 2010) band. TOEIC =880 (August, 2008)
- Proficient in Urdu, Hindi and Punjabi also. Intermediate to basic level of Korean and Italian. Basic level of Arabic language

## Volunteer work and International forums (camps)

- Lead a team for helping flood affected people in the worst flood in Sub Continent, 2009.
- Participated in Global Friendship Camp (2008) held in South Korea
- Attended 18th & 17th International Youth Forum in Seoul with topics "Multiculturalism" and "Youth Challenges in the ASEM Context" in year 2007 and 2008 respectively
- Participated in "International youth Camp", Seoul, South Korea (2008)
- Attended and partly organize an event "Global Students meeting Korean brands" (2007)
- Worked in the rehabilitation of people after earth quake in North West of Pakistan on 14 Oct. 2005

## Hobbies and Extra Curricular Activities

- Traveling, Writing, Hiking, Snow Hiking, Trekking, Table Tennis, Yoga, Running, Reading, Social Services

## Selected International Journal Publications and Conferences

### ISI/Scopus

- **How distributed situation awareness influences process safety**  
**S. Nazir**, L.J.Sorensen, K.I. Overgård, D. Manca  
Chemical Engineering Transactions, 36, 409-414, (2014)  
DOI: 10.3303/CET1436069
- **Experiment-based decision making in complex systems**  
S. Colombo, **S. Nazir**, A. Gallace, D. Manca  
Chemical Engineering Transactions, 36, 85-90, (2014)  
DOI: 10.3303/CET1436015
- **Procedure for automated assessment of industrial operators**  
D. Manca, **S. Nazir**, S. Colombo, A. Kluge  
Chemical Engineering Transactions, 36, 391-396, (2014)  
DOI: 10.3303/CET1436066
- **Advanced applications in process control and training needs of field and control room operators**  
A. Kluge, **S. Nazir**, D. Manca  
IIE Transactions on Occupational Ergonomics and Human Factors, (2014)  
DOI:10.1080/21577323.2014.920437
- **Immersive Virtual Reality for Decision Making in Process Industry: Experiment Results**  
S. Colombo, **S. Nazir**, D. Manca  
SPE Journal (accepted)
- **Automation in process industry: cure or curse? How can training improve operator's performance?**  
**S. Nazir**, A. Kluge, D. Manca  
Computer Aided Chemical Engineering, 33, 889-894 (2014)
- **Minimizing the risk in the process industry by using a plant simulator: a novel approach**  
**S. Nazir**, S. Colombo, D. Manca

- Chemical Engineering Transactions, 32, 109-114., (2013)
- **Impact of Training Methods on Distributed Situation Awareness of Industrial Operators**  
S. Nazir, L. J. Sørensen, K. I. Øvergård, D. Manca  
Safety Science (under second review)
  - **Immersive Virtual Environment or Conventional Training? Assessing the Effectiveness of Different Training Methods on the Performance of Industrial Operators in an Accident Scenario**  
S. Nazir, A. Gallace S. Colombo, D. Manca  
Submitted to Ergonomics (under review)
  - **Virtual Reality as Effective Means for Training: Results of Experiments Conducted with a Plant Simulator**  
S. Colombo, S. Nazir, D. Manca  
Proceedings of SPE European HSE Conference and Exhibition Health, Safety, Environment and Social Responsibility, 405-411, (2013)
  - **A Plant Simulator to Enhance the Process Safety of Industrial Operators**,  
D. Manca, S. Colombo, S. Nazir  
Proceedings of SPE European HSE Conference and Exhibition Health, Safety, Environment and Social Responsibility, 3, 1-11, (2013)
  - **Testing and analyzing different training methods for industrial operators: an experimental approach**  
S. Nazir, S. Colombo, D. Manca  
Computer Aided Chemical Engineering, 32, 667-672 (2013)
  - **Minimizing the risk in the process industry by using a plant simulator: a novel approach**  
S. Nazir, S. Colombo, D. Manca  
AIDIC Conference Series, 11, 271-280, (2013)
  - **Virtual Reality And Augmented-Virtual Reality as tools to Train industrial operators**  
S. Nazir, R. Totaro, S. Brambilla, S. Colombo, D. Manca  
Computer Aided Chemical Engineering, 30, 1398-1401, (2012)
  - **The role of Situation Awareness for the operators of process industry**  
S. Nazir, S. Colombo, D. Manca  
Chemical Engineering Transactions, 26, 303-308, (2012)
  - **Performance indicators for the assessment of industrial operators**  
D. Manca, S. Nazir, F. Lucernoni, S. Colombo  
Computer Aided Chemical Engineering, Vol 30, 1422-1426, (2012)
  - **Performance Indicators For Training Assessment Of Control-Room Operators**  
D. Manca, S. Nazir, S. Colombo  
Chemical Engineering Transactions, 26, 285-290, (2012)
  - **Towards holistic decision support systems including human and organizational performances in the loop**  
S. Colombo, S. Nazir, D. Manca  
Computer Aided Chemical Engineering, 31, 295-299, (2012)
  - **A new soft sensor based on recursive partial least squares for online melt index predictions in grade-changing HDPE operations**  
Ahmed, F., S. Nazir, Yeo, Y.K.Y.  
Chemical Product and Process Modeling 4 (1), 2009

## Conferences

- **Characteristics of Dynamic Positioning Operators' Situation Awareness and Decision Making during Critical Incidents in Maritime Operations**  
Øvergård, K. I., Sørensen, L. J., Tone J. Martinsen, **S. Nazir**  
5th International Conference on Applied Human Factors and Ergonomics AHFE 2014, Kraków, Poland 19-23 July 2014 (accepted)
- **Distributed situation awareness of industrial operators: Models and measurement methods**  
**S. Nazir**, L. Soerensen, K. Ivar Øvergård and D. Manca  
5th International Conference on Applied Human Factors and Ergonomics AHFE 2014, Kraków, Poland 19-23 July 2014 (accepted)
- **Multi-objective and Systematic Performance Analysis of Industrial Operators**  
**S. Nazir**, D. Manca, Kjell Ivar Øvergård (2014)  
Accepted in HFES Europe Chapter Annual Conference Lisbon (October, 2014)
- **Can immersive virtual environments make the difference in training industrial operators?**  
**S. Nazir**, A. Kluge, D. Manca, in D. De Waard, K De Waard, D., Toffetti, A., [more] (Eds.) (2014), Human Factors: sustainable life and mobility., Human Factors: a view from an integrative perspective. Proceedings HFES Europe Chapter Conference, Turin 2013.
- **Performance comparison of different training methods for industrial operators**  
**S. Nazir**, S. Colombo, A. Gallace, M. Bordegoni, D. Manca, (2012)  
Proceedings HFES Europe Chapter Conference Toulouse 2012, 235-242
- **Use of virtual reality for anticipation and reduction of risks in process industry**  
**S. Nazir**, S. Colombo, D. Manca  
Society of Risk Analysis (SRA) Europe Annual Meeting, "Anticipating Major Risks", Zurich, June 18-20, 2.1, 1-24, (2012)

## Personal Information

- **Date of Birth** December 16, 1983
- **Resident Permit** Italian valid till 19-03-2015
- **Nationality** Pakistani
- **Marital Status** Single
- **Passport number** AU9820482

## Reference

- Prof. Dr. Davide Manca, Process Systems Engineering lab, CMIC Chemical Engineering Department Politecnico di Milano, 20133, Milan. Italy. E-mail: [davide.manca@polimi.it](mailto:davide.manca@polimi.it)
- Prof. Dr. Annette Kluge, Faculty of Engineering, Department of computer science and cognitive University of Duisburg-Essen, Germany, E-mail: [annette.kluge@uni-due.de](mailto:annette.kluge@uni-due.de)