

**Resume of  
Dr. Stanislaw Raczynski**

as for October, 2016

**PERSONAL DATA**

**ORCID id:** [orcid.org/0000-0003-1501-4205](http://orcid.org/0000-0003-1501-4205)

**ResearcherID:** <http://www.researcherid.com/rid/F-9686-2012>



**Nationality:** Polish (Mexican resident)

**Current address:** Unidad ISSFAM, Ed.C-11, Dep. 203, col. Villa Tlalpan, P.O Box 22-783, Mexico City 14680, Mexico

**E-mail address:** [stanracz@stanr.com](mailto:stanracz@stanr.com)

**Personal page:** <http://www.raczynski.com>

ResearchID F-9686-2012 ORCID [orcid.org/0000-0003-1501-4205](http://orcid.org/0000-0003-1501-4205)

**Date and place of birth:** October 9, 1938, Krakow, Poland

Languages:

Polish (native)

Spanish (fluently)

Russian (fluently)

English (fluently)

**CURRENT POSITIONS:**

Professor, Universidad Panamericana, Mexico City

Director, McLeod Institute of Simulation Sciences, Center at the Universidad Panamericana

Researcher, National System of Researchers of Mexico (Sistema Nacional de Investigadores, México)

Member, Doctoral Committee (Claustro Doctoral), National Autonomous University of Mexico (UNAM), Mexico City, Mexico

Member, Doctoral Committee (Claustro Doctoral), Orizaba Institute of Technology, Orizaba, Mexico

**PAST POSITIONS:**

Vice President for research, The Society for Computer Simulation Simulation (SCS, now The Society for Modeling and Simulation International), San Diego, CA, 1986-1994

International Director, The Society for Computer Simulation, 1994-1999 and 2001-2003

**ACADEMIC DEGREES**

School	Academic field	Dates and degrees
Academy of Mining and	Electrical Engineering	M.Sc., 1959-1964

Metallurgy, Krakow, Poland		
Academy of Mining and Metallurgy, Krakow, Poland	Technical Sciences - Automatic Control	Ph.D., 1969
Academy of Mining and Metallurgy, Krakow, Poland	Optimization Methods	Habilitation degree (Dr.Sc), 1977

### **OTHER PROFESSIONAL TRAINING**

The Course on Modeling of Global Energy Systems, Vienna, Austria, The International Institute for Applied Systems Analysis, November 1980

### **SOCIETIES AND PROFESSIONAL ORGANIZATIONS**

1. The Society for Computer Simulation, Senior Member
2. Reviewer, Mathematical Reviews, 1980-1995
3. Member, European Workshop on Industrial Computer Systems, Brussels, 1980-1982
4. Academic Advisor, IEEE, chapter at the Universidad Panamericana

### **IMPORTANT AWARDS and CERTIFICATES**

1. Award of the Ministry of Higher Education of Poland for relevant achievements in scientific research, Warsaw, Poland, October 1970
2. Certificate of Senior Membership, presented to Dr. Raczynski for the "Outstanding technical achievements and distinguished contributions to the Society and the profession", by The Society for Computer Simulation International, San Diego, CA, June 1994
3. Appointment as a researcher in the National System of Researchers of Mexico (SNI, a dependency of the National Council for Science and Technology of Mexico, CONACYT) as a recognition of achievements in scientific research, 1994.

### **APPOINTMENTS**

Position	Institution	Dates
Assistant professor	Academy of Mining and Metallurgy, Krakow, Poland	1964-1969
Adjunct	Academy of Mining and Metallurgy, Krakow, Poland	1969-1977
Associate professor	Academy of Mining and Metallurgy, Krakow, Poland	1977-1983
Head, Computer Center	Academy of Mining and Metallurgy, Krakow, Poland	1969-1972
Head, Systems Analysis Group	Academy of Mining and Metallurgy, Krakow, Poland	1977-1983
Head, the activity on Computer Simulation of the Human Immune	The Society for Computer Simulation, San Diego CA	1990-1998

System		
Researcher	International Research Group, Institute for Control Problems, Mascow, USSR	1972-1976
Professor	National Autonomous University of Mexico (UNAM), Mexico City, Mexico	1983-1986
Professor	Univarsidad Panamericana, Mexico City	1986 -

## PUBLICATIONS

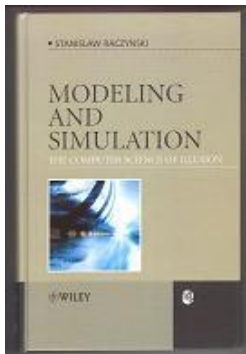
Doctoral thesis title: Analytic construction of optimal controllers

Habilitation (Habilitated doctor) thesis title: Algorithms and programs for global optimization

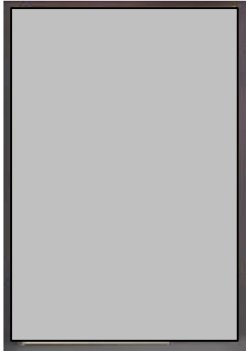
## Books



"Simulación por computadora", NORIEGA EDITORES, 1993, Mexico City.



"Modeling and Simulation: Computer Science of Illusion", Wiley, England, 2006.



"Differential inclusions in modeling and simulation: Uncertainty treatment, optimal control", Springer Verlag, to appear in 2017

Citations, due to Google Academic:



### Other publications:

#### Book chapters

1. Determinando estrategias del mercado con herramientas de la teoría de control óptimo. , in: Fronteras en Economía Financiera (Francisco Ortiz, eds.) , Universidad Panamericana, Mexico City, Mexico City, ISBN/ISSN 978-607-7905-07-3, 2012.
2. Conjuntos alcanzables e incertidumbre en la bolsa de valores y mercadotecnia: Aplicaciones de las inclusiones diferenciales. , in: Avances recientes en evaluación de activos y administración de riesgos (Francisco Ortiz Arago, eds.) , Universidad Panamericana Press, Mexico City, 2010.
3. Continuous Simulation. , in: in Encyclopedia of Information Systems, Academic Press, Elsevier Publ, New York NY, 2003.

#### Journal articles

1. Influence of the gregarious instinct and. *Journal of Human*, Taylor & Francis Group , URL: <http://dx.doi.org/10.1080/10911359.2017.1388758>, DOI: 10.1080/10911359.2017.1388758 , ISBN/ISSN ISSN: 1091-1359
2. Semi-discrete events with fuzzy logic. *Journal of Simulation*, The OR Society , Palgrave macmillan, 2017; , ISBN/ISSN ISSN: 0953-5543.
3. Why a jetliner vibrates during takeoff: simulating air oscillations under the wing. *International Journal of Aerodynamics* , Inderscience Publishers, 2016; 5:2:125-132, DOI: 10.1504/IJAD.2016.10001540.
4. Agents and Events: the Objective of Action, Finite Event Duration, and Fuzzy Logic. *International Journal on Information Technology* , Praise Worthy Prize, 2015; 3:2:34, ISBN/ISSN ISSN: 2281-2911.

5. Differential inclusion approach to the stock market dynamics and uncertainty. *Economy Computing Optimization Risks Finance Administration Net Business* 2015; 1:1:58-65, ISBN/ISSN 2444-3204.
6. A Market Model: Uncertainty and Reachable Sets. *International Journal for Simulation and Multidisciplinary Design Optimization* , EDP Sciences, 2015; 6:A2, URL: <http://www.ijsmdo.org/articles/smdo/abs/2015/01/smdo140008/smdo140008.html> , ISBN/ISSN (Electronic Edition): 1779-6288.
7. Simulation and optimization in marketing: optimal control of consumer goodwill, price and investment. *International Journal of Modeling, Simulation, and Scientific Computing* , World Scientific Publishing Company, 2014; 5:3.
8. Simulating self-organization and interference between certain hierarchical structures. *Nonlinear Dynamics Psychology and Life Sciences* , Human Sciences Press, 2014; 18:4:419-434, ISBN/ISSN 1090-0578.
9. Semi-discrete events and models in categorical language. *International Journal of Simulation Modelling* 2012; 11:2:77-88.
10. Uncertainty, dualism and inverse reachable sets. *International Journal of Simulation Modelling* 2011; 10:1:38-45, ISBN/ISSN 1726-4529.
11. Co-author: Leszak Kawecki, Simulation of Dynamic Analog Converter of Square. *Journal of Applied Computer Science* 2009; 17:1:43-53.
12. Determination of attainable regions in ship maneuvers: an application of differential inclusions to the modeling of ship dynamics. *Journal of Marine Science and Technology* , Springer Verlag, 2007; 12:1.
13. A Self-destruction Game. *Journal of Nonlinear Dynamics, Psychology and Life Sciences* 2006; 10:4:471-483, ISBN/ISSN 1090-0578.
14. Continuous simulation, differential inclusions, uncertainty and traveling in time. *Transactions fo the Society for Computer Simulation Int.* , SCS, 2004; 80:2:87-97.
15. Simulation of the Dynamic Interactions Between Terror and Anti-Terror Organizational Structures. *The Journal of Artificial Societies and Social Simulation* 2004; 7:2, ISBN/ISSN 1460-7425.
16. M.Mora, F.Cervantes et al ,Implementation of Decision Making Support Systems:. *Innovations in Decision Support Systems* , Advanced Knowledge International, 2003; .
17. Alternative mathematical tools for modeling and simulation: Metric space of models, uncertainty, differential inclusions and semi-discrete events. *Simulation News Europe* 2002; :35/36:3-10, ISBN/ISSN 0929-2268.
18. The PASION Simulation System. *Simulation News Europe* 2002; 35/36:24-28, ISBN/ISSN 0929-2268.
19. Alternative mathematical tools for modeling and simulation. *Simulation News Europe* 2002; 35/36:24-28.
20. Creating galaxies on a PC. *SIMULATION* 2000; 74:3.
21. On the metric structure in the space of dynamic system models. *Transactions of the Society for Computer Simulation International* , SCS, 1998; 15:2:70-75.
22. Co-author: Leszek Kawecki, Coupling nonlinear models in object-oriented simulation: application to drives with multiple induction motors. *SIMULATION* , SCS, 1998; 70:2:119-126.
23. Simulating the Dynamics of Granular Media : the Oscillon Phenomenon. *Computer Modeling and Simulation in Engineering* 1997; 2:4:449-454.
24. When the system dynamics ODE models fail. *SIMULATION* 1996; 67:5:343-349.

25. Differential inclusions in system simulation. *Transactions of the Society for Computer Simulation* 1996; 13:1:47-54.
26. Manufactura Integrada por Computadora, Tecnología de Grupos y Simulación por Computadora. *Revista Estrategia Industrial* 1994; :120:12-15.
27. PASION tutorial. *Advances in Materials Technology: Monitor* , United Nations Industrial Development Organization UNIDO, 1992; 27/28.
28. Graphical description and a program generator for queuing models. *SIMULATION* 1990; 55:3:147-152.
29. Process hierarchy and inheritance in PASION. *SIMULATION* , SCS, 1988; 50:6:249-251.
30. On a simulation experiment with a parallel algorithm for optimal control. *Transactions of the Society for Computer Simulation* 1988; 5:1:87-97.
31. Computadoras en Mercadotecnia. *Informatica* 1987; January 1987.
32. PASION, lenguaje para simulacion: una intraducción. *ComputerWord/Mexico* 1987; 178.
33. Pasion. Pascal related simulation language for small systems. *SIMULATION* , SCS, 1986; 46:6.
34. Some remarks on nonconvex optimal control. *Journal of Mathematical Analysis and Applications* 1986; 118:1, ISBN/ISSN 0022-247X.
35. On some generalization of "bang?bang" control. *Journal of Mathematical Analysis and Applications* 1984; 98:1:282-295, ISBN/ISSN : 0022-247X.
36. Simulacion digital de sistemas: una introduccion. *Revista OIO* 1984; 4:15.
37. Orientor fields and control systems (in Polish),. *Scientific Bulletins of the Academy of Mining and Metallurgy* 1982; 864.
38. Dynamic optimization of employment policy in the exploitation flats based on the systems analysis methods (in Polish). *Scientific Bulletins of the Academy of Mining and Metallurgy, "Gornictwo"* 1982; 6:3.
39. On control systems in a Banach space without compactness assumptions. *Systems Science* 1980; 6.
40. On nonconvex control in a separable Banach space. *Problems of Control and Information Theory* 1980; 9.
41. Stochastic optimization algorithm for nonlinear discrete models of production systems. *Problems of Control and Information Theory* 1978; 7.
42. A global optimization procedure for dynamical systems. *Problems of Control and Information Theory* 1976; 5.
43. Algorithms and computer programs for global optimization. *Scientific Bulletins of the Academy of Mining and Metallurgy* 1976; 520.
44. The Sufficient Condition for Optimal Control. *Archiwum Automatyki i Telemekhaniki* 1970; .
45. Application of the series of orthogonal functions to the synthesis of optimal control systems. *Scientific Bulletins of the University of Mining and Metallurgy* 1969; 209:83-91.
46. Applicability of the tendor control (of bang-bang type) in nonlinear optimal. *Bulletin de l'Academie Polonaise des Sciences, Serie des Sciences Techniques* 1969; 17.
47. On the problem of invariance of nonlinear systems. *Archiwum Automatyki i Telemekhaniki* 1968; 13.

## Conference proceedings

1. Takeoff vibrations of a jetliner: simulating possible cause. *Conference paper: Annual Simulation Symposium*, The Society for Modeling and Simulation (The Society for Modeling and Simulation, eds.) , Pasadena CA, ISBN/ISSN 1-56555-359-4, 2016.
2. Modeling and simulation of the movements of social groups over regions with dynamically changing welfare opportunities. *Conference paper: 25 Annual International Conference of the Society for Chaos Theory in Psychology & Life Sciences*, Gainesville FL, 2015.
3. Abstract social and political systems simulation: the concept of the space of ideas and object-oriented simulation. *Conference paper: 4th International Conference on Simulation and Modeling Methodologies*, Vienna Austria, 2014.
4. Discrete Event Approach to the Classical System Dynamics. *Conference paper: Huntsville Simulation Conference, SCS*, Huntsville AL, 2009.
5. Flight Maneuver Simulation: Attainable Sets for Flight Trajectories. *Conference paper: Summer Computer Simulation Multi-Conference*, Edinburgh, Scotland, 2008.
6. PSM++ and Blues Simulation System. *Conference paper: Winter MultiConference HLSLA07*, San Diego CA, ISBN/ISSN 1-56555-311-X, 2007.
7. Reachable Sets for a Marketing Game: Looking for New Modeling Tools. *Conference paper: Summer Computer Simulation Conference, The Society for Modeling and Simulation*, Philadelphia PA, ISBN/ISSN 1-56555-299-7, 2005.
8. Simulation of turbulence and oscillating gas flow: Applications of Fluids32.2 fluid flow simulator. *Conference paper: 10th Workshop of the Polish Society for Computer Simulation*, Zakopane, Poland, 2004.
9. Co-authors: Crosbie Roy, Huntsinger Ralph, SimEd: A New Initiative in Simulation Education. *Conference paper: Winter Multiconference*, San Diego CA, 2004.
10. Co-author: Trujillo Jose Luis, Especificacion estandar para la modelacion y simulacion de sistemas de manufactura. *Conference paper: VIth Conference on Computer Simulation and Industry Applications, McLeod Institute for Simulation Sciences*, Tijuana Mexico, 2003.
11. Simulating General Relativity. *Conference paper: SCS Summer Computer Simulation Conference*, Montreal Cznada, 2003.
12. Object-oriented simulation: PAsION tutorial. *Conference paper: VIth Conference on Computer Simulation and Industry Applications, McLeod Institute for Simulation Sciences*, Tijuana Mexico, 2003.
13. Are discrete models valid?. *Conference paper: VIth Conference on Computer Simulation and Industry Applications, McLeod Institute for Simulation Sciences*, Tijuana, Mexico, 2003.
14. Co-author: Trujillo Jose Luis, On a standard, language-independent description of manufacturing systems for modeling and simulation purpose. *Conference paper: Summer Computer Simulation Conference*, The Society for Computer Simulation, San Diego CA, 2002.
15. Differential Inclusion Solver. *Conference paper: International Conference on Grand Challenges for Modeling and Simulation, SCS*, San Antonio TX, 2002.
16. An application of the PAsION queuing model generator to simulation of manufacturing systems. *Conference paper: Production, Robotics and Integration Software for Manufacturing & Management (PRISM) Symposium*, Purdue University, Lafayette, 2001.

17. Alternative mathematical tools for modeling and simulation: Metric space of models, Uncertainty, Differential Inclusions and Semi-discrete Events. *Conference paper: European Simulation Symposium ESS2000, Hamburg,, Hamburg, Germany, 2000.*
18. Un pequeño "big-bang". *Conference paper: V Conferencia Internacional sobre Simulación por computadora e Inteligencia Artificial, McLeod Institute for Simulation Sciences, Mexico City, 2000.*
19. Simulación de los procesos jurídicos. *Conference paper: V Conferencia Internacional sobre Simulación por computadora e Inteligencia Artificial, McLeod Institute for Simulation Sciences, Mexico City, 2000.*
20. Combined simulation: PAsION approach. *Conference paper: Summer Computer Simulation Conference, The Society for Computer Simulation, Chicago IL, 1999.*
21. Continuous system simulation in PAsION32. *Conference paper: IV Conferencia Internacional sobre Simulación por computadora e Inteligencia Artificial, McLeod Institute for Simulation Sciences, Universidad Panamericana, Mexico City, 1998.*
22. Simulating Mechanisms Driven by Multiple Induction Motors. *Conference paper: Summer Computer Simulation Conference SCSC'97, The Society for Computer Simulation, Arlington VA, ISBN/ISSN 1-56555-123-0, 1997.*
23. Complex Dynamic Systems Simulator: an Object-oriented Appraoach. *Conference paper: SCSC'96 Conference, The Society for Computer Simulation, Portland OR, ISBN/ISSN ISBN 1-56555-098-6, 1996.*
24. Pitfalls is Systems Dynamics. *Conference paper: SCSC'95 Conference, Ottawa Canada, ISBN/ISSN 1-56555-081-1, 1995.*
25. PAsION Animator. *Conference paper: III Conference on Computer Simulation, McLeod Institute of Simulation Sciences & Universidad Panamericana, Mexico City, 1995.*
26. Gráficas Bond - Aplicación en la simulación de un temblor. *Conference paper: Symposium on Computer Simulation and Artificial Intelligence, Universidad Panamericana & The Society for Computer Simulation, Mexico City, 1994.*
27. Describing Queuing Models in Natural Language. *Conference paper: SCS Conference on Simulation in Engineering Education, LaJolla, CA, ISBN/ISSN 1-56555-020-X, 1993.*
28. PAsION Tutorial. *Conference paper: Winter '92 Multiconference of the Society for Computer Simulation, Newport Beach, CA, 1992.*
29. An Object-oriented Simulation program for Urban Traffic and Pollution Problem. *Conference paper: Symposium on Computer Simulation in Industrial Engineering and in the Problems of Urban Development, Universidad Panamericana and The Society for Computer Simulation, Mexico City, 1992.*
30. PAsION: object oriented simulation on the PC. *Conference paper: 1990 System Dynamics Conference, Cambridge, MA, 1990.*
31. Paquete para calsicacin de operaciones, herramientas y maquinas. *Conference paper: Tercera Reunión Nacional de CAD/CAM, Puebla, Mexico, 1989.*
32. Optimizacin y simulacin por computadora de las estrategias en mercadotecnia. *Conference paper: Primer Seminario para el Desarrollo Comercial y la Confederacin de Camaras Nacionales de Comercio (CONCANACO), Mexico City, 1989.*
33. Simulating our immune system. *Conference paper: SCS Multiconference, Simulation on Microcomputers, San Diego CA, 1989.*



34. Pasion. The language and its environment. *Conference paper: SCS Multiconference, Simulation on Microcomputers*, San Diego CA, 1988.
35. Pasion Un lenguaje para simulacion. *Conference paper: XIII Congreso de la Academia Nacional de Ingenieria*, Guanajuato Mexico, 1987.
36. On a parallel Computational Algorithm for Optimal Control Problems. *Conference paper: American Control Conference*, Seattle WA, 1986.
37. Optimizacion y simulacion por computadora de las estrategias en mercadotecnia. *Conference paper: V Congraso Nacional de Ingenieria Industrial*, Guadalajara Mexico, 1986.
38. Simulating Parallel Computational Process for Optimal Control Problems. *Conference paper: SCS Eastern Simulation Conferences*, Norfolk VA, 1985.
39. Co-author: Dolik Maria, On Simulation and Optimization of Certain Model of Solidification Process. *Conference paper: American Control Conference*, Boston MA, 1985.
40. El principio de maximum en espacios abstractos. *Conference paper: Decimo Congreso de la Academia Nacional de Ingenieria*, Ciudad Obregon, Mexico, 1984.
41. Simulating and Optimizing Dynamic Market Behavior on PCs. *Conference paper: Second PC Faire*, San Francisco CA, 1984.
42. On the staff part of a model of a large production system. *Conference paper: Noveno Congreso de la Academia Nacional de Ingnieria*, Leon GTO, 1983.
43. Simulation of interaction between certain hierarchical structures. *Conference paper: Simulation of Large Systems*, Universitat Bielefeld, Bielefeld, 1980.
44. On optimal control and reachable sets in a Banach space. , Springer Verlag, LNCIS, 22, New York NY, 1980.
45. Modele numerique por la simulation de certaines classes de procede metallurgique et son utilization pour l'optimization de la qualite de produit. *Conference paper: IFAC Conference on Digital computer applications to process control*, Zurich, 1974.
46. On the determination of the reachable sets and optimal control by the random method. *Conference paper: Symposium IFAC on Optimization Methods*, Varna, Bulgaria, 1974.
47. On the determination of emission zones and optimum trajectories of nonlinear control systems. *Conference paper: IVth Congress of the International Federation of Automatic Control*, Warsaw, 1969.
48. Application of the orientor field theory to the optimal control problem of nonlinear systems. *Conference paper: IVth Polish Conference on Automatics*, Krakow, 1967.

### **Computer programs**

1. RISCC. , Computer program , RIS file creator, converter, URL: <http://www.raczynski.com/riscc/ris.html> , 2015.
2. PidFeel. , Computer program , PID controller settings, URL: <http://www.raczynski.com/pid/pidfeel.htm> , 2014.
3. MarketAhead. , Computer program , Market model and prediction, URL: [www.raczynski.com/mahead/mah.htm](http://www.raczynski.com/mahead/mah.htm) , 2013.
4. Stlicer. , Computer program , Convert STL file into slices, URL: <http://www.raczynski.com/slice/stlicer.htm> , 2012.
5. BLUESSS Package. , Computer program , Blues Simulation System, URL: <http://www.raczynski.com/pn/bluesss.htm> , 2012.
6. Fluids6.3. , Computer program , URL: <http://www.raczynski.com/pn/fluids.htm> , 2012.

7. HeatHit. , Computer program , Heat Transfer Simulator, URL:  
<http://www.raczynski.com/pn/heathit.htm> , 2010.
8. PSM++. , Computer program , URL: <http://www.raczynski.com/pn/pn.htm> , 2010.
9. TRAFFS. , Computer program , Road Traffic Simulator, 2009.
10. MAKEROB. , Computer program , Robot kinematics, URL:  
<http://www.raczynski.com/pn/makerob.htm> , 2008.
11. CARDYNS. , Computer program , Car Dynamics Simulation, Raczynski Consulting,  
URL: <http://www.raczynski.com/pn/cardyns.htm> , 2005.
12. Simulation Encyclopedia. , Computer program , , URL:  
<http://www.raczynski.com/pn/encyk.htm> , 2000.

### **Editorial work:**

1. Guest Editor, International Journal SIMULATION, (SCS) San Diego CA, vol.54, no1, January 1990
2. Main editor, Proceedings, International Conference Computer Simulation in Industrial Engineering and in the Problems of Urban Development, Mexico City, 1992
3. Main editor, Proceedings, International Conference on Computer Simulation and Artificial Intelligence, Mexico City, 1994
4. Main editor, Proceedings, International Conference on Computer Simulation, Mexico City, 1995
5. Main editor, Proceedings, International Conference on Computer Simulation and Artificial Intelligence, Mexico City, 1998
6. Main editor, Proceedings, International Conference on Computer Simulation, Mexico City, 2000

### **AREAS OF SIGNIFICANT TRAINING AND TECHNICAL COMPETENCE**

1. Automatic control theory and applications
2. Modeling, new mathematical tools
3. Robotics
4. Computer simulation, theory and applications
5. Computer graphics

### **DIDACTIC ACTIVITIES**

Courses at both undergraduate and graduate level on:

Elements of Automatic Control

Control and Measurements

Electronics

Advanced Electronics

Optimal Control

Non-linear Systems

Operations Research

Computer Simulation  
Laboratory on Automatic Control  
Laboratory on Advanced Electronics

The above courses have been delivered (in Polish and Spanish) between 1964 and 2001 at the Academy of Mining and Metallurgy in Poland, National Autonomous University of Mexico and Universidad Panamericana in Mexico. In total equivalent of about 200 one-semester courses.

Other activities:

Actually main advisor of six doctoral theses.

## **PROFESSIONAL ACHIEVEMENTS**

### **Field of Automatic control**

In this field I have been working on optimal control theory. My main contributions belong to the area of the theory and applications of the Pontryagin Maximum Principle. In particular, I have contributed with several theorems and relevant works on the optimal control of infinite-dimensional systems that must be analyzed using abstract spaces. My articles and papers and articles no. 1,5,7,8,9,10,12,30,31,33, and proceedings 4 i 8 contribute to this field of research.

### **Optimization methods**

This area is closely related to optimal control theory. My main contribution to optimization methods is my habilitation degree thesis "Algorithms and programs for global optimization". My articles no.5,6,7 and 18 describe my main contributions in this field.

### **Computer simulation**

My main contributions are:

1. Simulation system PASION. This is a general-purpose simulation system developed in Delphi Pascal. PASION supports discrete event simulation, queuing and manufacturing models, continuous simulation including ODE (Ordinary Differential Equations) , Signal-flow Graphs, Bond Graphs and any combination of the above. My articles no. . 15, 17 to 21, and papers in proceedings nr.10, 12, 15, 16, 17, 19, 21, 23, 24, 25, 26, 27, 28, 29 , 30 ,31 ,33 ,36 ,37 i 39 describe PASION concepts and applications. The PASION main page is <http://www.raczynski.com/pn/pn.htm>

2. Theory and new methods in modeling and simulation.

In this field I contributed with new mathematical tools and algorithms that can be used in modeling and simulation. The main contributions are:

Applications of differential inclusions in modeling and simulation, and uncertainty treatment. This research was published in the Transactions of the Society for Computer Simulation and was a main topic of my keynote speech on the ESS2000 Conference, Hamburg, Germany (see the list of publications no. 23, 33 and proceedings nr.32).

A metric structure in the space of models. This is a methodology for comparing models with similar or different structure. See publications no. 27 and proceedings nr.32.

. Heat transfer simulation. See <http://www.raczynski.com/pn/heathit.htm>

## **ADMINISTRATIVE AND LEADERSHIP WORK**

I was **head of the Computer Center** at the Academy of mining and Metallurgy in Krakow, Poland between 1969 and 1972, with the staff of about 70. We achieved a relevant progress in applications of new hardware and software, and in developing new application for many projects carried out at the Academy.

Between 1977 and 1983 I was **head of the System Analysis Group** of the Academy of mining and Metallurgy in Krakow, Poland. I conducted many projects, mainly on computer simulation made for Polish industry.

From 1992 to 1995 I was a **Vice President for Research** of the Society for Computer Simulation, and 1995 to 1999 I was **the International Director and a member of the SCS Board of Directors**. My main area of activities was the promotion and popularization of computer simulation in Latin America. The main achievement was the growth of the number of the SCS in the region, the creation of the Mexican Center of the McLeod Institute of Simulation Sciences, and the organization of five international conferences on computer simulation in Mexico City.

Between 1990 and 1998 I was **head of the Activity on Simulation of the Human Immune System**, of the Society for Computer Simulation.

## **PROJECTS**

Actually participaytes in the project ARNOG - Dental Perfect - Simulación de operaciones en grandes clínicas dentales, CEPII Universidad Panamericana.