

Date: September 2008

RESUME

Professor Moshe Shpitalni

Identification Number: 0-0501700-9

Date and place of birth: June 9, 1947, Rehovot, Israel

Additional personal details: Married + 3

ACADEMIC DEGREES

B.Sc. 1972, Mechanical Engineering - Technion, Haifa, Israel

M.Sc. 1975, Mechanical Engineering - Technion, Haifa, Israel

D.Sc. 1980, Mechanical Engineering - Technion, Haifa, Israel

ACADEMIC APPOINTMENTS

1/99 - present: Schlesinger Chair in Manufacturing Systems

6/98 - present: Professor, Technion - Israel Institute of Technology

7/01 – 7/02 Visiting Professor, University of Michigan, Ann Arbor MI USA

10/97 - 1/98: Visiting Professor, University of Tokyo, Tokyo, Japan.

9/97 - 10/97: Visiting Professor, Technical University of Denmark (DTU).

7/90 - 6/98: Associate Professor, Technion - Israel Institute of Technology.

1988: Tenure, Technion - Israel Institute of Technology.

8/87 - 8/88: Visiting Associate Professor, University of California at Santa Barbara.

1/85 - 6/90: Senior Lecturer, Technion - Israel Institute of Technology.

8/83 - 12/84: Lecturer, Technion - Israel Institute of Technology.

5/81 - 7/83: Visiting Asst. Professor, Rensselaer Polytechnic Institute, Troy, N.Y.

10/80 - 2/81: Lecturer, Technion - Israel Institute of Technology.

1980: Teaching Instructor, Technion - Israel Institute of Technology.

1976 - 1977: Teaching Instructor, Technion - Israel Institute of Technology.

1973 - 1975: Teaching Assistant, Technion - Israel Institute of Technology.

PROFESSIONAL EXPERIENCE

- 2001: Academic evaluation of the Politecnico Di Torino, Italy.
- 1998: **Cimatron, Israel:** CAD/CAM Systems.
- 1992-1993: **Amada Metrecs, Japan:** Advances in FMS for sheet metal software development
- 1990: **Rob-CAD, Herzilya:** Geometrical Modelers for Numerical Control Program Verification.
- 1987-1991: **Sorba, Holland:** Development of Origami a CAD/CAM system for the sheet metal industry.
- 1985, 1981: **Conlog Control Ltd., Petach-Tikva:** In-depth evaluation of several specific CAD systems and their ability to be integrated with the Numericon 850 system (1985).
Numerical Control Systems: Development of new systems (1981).
- 1985: **Cyclone Aviation Products Ltd., Carmiel:** Evaluation of CAD/CAM systems for aviation products.
- 1984: **“Rafael”, Haifa:** Evaluation of CAD/CAM systems.
- 1982, 83: **Elron:** Conceptual design of a new product--the Elcam System: a graphical system for interactive programming of machine tools based upon the APT language.
- 1980, 81: **Isralaser-Reim (Kibbutz Reim):** Cutting by a CO₂ Laser of various materials. Optimization of numerical control codes for the laser cutting process.
- 1974, 75: **Kibbutz Merchavia:** Development and design of the numerical control unit for both an off-line and an on-line system for producing holes in irrigation pipes. (Part of my work at the Technion--not related to my M.Sc. project.)

RESEARCH INTERESTS

- Application of Geometrical Modeling and Reasoning to Manufacturing Process Planning for automatic assembly (particularly automatic order and sequence determination) and for sheet metal (stamping, punching and bending).
- CAD/CAM Systems; Computational Geometry for CAD/CAM; Geometrical Modeling.
- CAD and CAM of sheet metal products and automatic generation of numerical control codes for their production (laser cutting, punching, stamping, bending, and welding).
- Life Cycle Engineering (Design, Manufacturing, Maintenance)
- Man-Machine Interfaces for Product Definition in CAD systems.
- Reconfigurable Manufacturing Systems.
- Non-Polynomial Problems in Manufacturing and Assembly.

TEACHING EXPERIENCE

- Technion - Israel Institute of Technology, 10/80-2/81, 10/83-7/87, 10/88-present: Computer Graphics, Computational Geometry for CAD/CAM, independent projects in CAD/CAM. New course: Selected Topics in Mechanical Engineering 4 (2005/6).
- Rensselaer Polytechnic Institute, N.Y., 5/81-7/83: Modeling and Control, Numerical Control for Machine Tools.
- University of California at Santa Barbara, 9/87-6/88: Introduction to CAD/CAM.

TECHNION ACTIVITIES

1/06- 12/08 and 1/09 - present:

Dean, Technion Graduate School

Member, MERAKEZET Committee

Member, Scholar and Prizes Committee

Member, Standing Committee Undergraduate and Graduate Studies

Member, Standing Committee for Honorary Degree

Member of the Senate (Since 1998)

Member of the Sabbatical Committee

9/04 – 12/05: Vice Dean, Technion Graduate School

1/04 – 8/04: Member, Technion Graduate School - Degrees Committee.

10/03-present: Head, Computer Committee - Faculty of Mechanical Engineering.

3/98-present: **Head, Minerva Schlesinger Laboratory for Life Cycle Engineering**

1/03 -12/08: **Member, Directors Advisory Council, Samuel Neaman Institute.**

1/03 - 12/03: Member, Technion Graduate School - Degrees Committee.

10/84-9/01, **10/02-present:**

Head of the CAD & Life Cycle Engineering (Formerly Computer Graphics and CAD Lab (Faculty of Mech. Eng.).

1992-7/001: Technion Committee: Continuing Education for Engineers.

3/98-12/01: Head of the J.W. Ullmann Center for Manufacturing Systems and Robotics.

10/00-8/01: Chairman, Technion Joint Faculty-Student Committee.

1/00: Appointed member of the Technion Joint Faculty-Student Committee.

1/98-12/00: Nomination Committee for Research Team, Technion R&D.

1/97-10/98: Member, Technion Steering Committee No. 283 for Information Technology.

1987-1997: Head, CAD/CAM Specialization Courses.

1/95-10/95: Member of the Senate Standing Committee for Undergraduate and Graduate Studies.

10/94-9/95: Associate Dean for Undergraduate Studies (Mech. Eng.),.

- 10/93-9/94: Coordinator of Undergraduate Studies (Mech. Eng.).
 8/83-9/84: Development of the Computer Graphics and CAD Lab.
 1980/81: Acting Head of the Numerical Control Lab.
 1980/81: Acting Head of the Laser Lab (Mech. Eng. Dept.).

PUBLIC PROFESSIONAL ACTIVITIES

Significant Activities

- 6/04 - present: Directory Board, EU Network of Excellence VRL-KCiP**
- 5/03 - 5/08: Appointment by the Senate of Berlin to the Georg Schlesinger Prize Committee.**
- 8/03 - 8/06: Chairman STC (Scientific Technical Committee) on Design - The International Academy for Production Engineering (CIRP).
 8/00 - 8/03: Member, Standing Editorial Committee (2nd term) - The International Academy for Production Engineering (CIRP).
 8/00 - 8/03: Vice Chairman, Scientific Technical Committee on Design - The International Academy for Production Engineering (CIRP).
 7/99 - 9/02: Fifth Framework Programmes Expert Advisory Group (EAG) on "Innovative products, processes and organisation"
 8/97-8/00: Secretary, Scientific Technical Committee on Design - The International Academy for Production Engineering (CIRP).
 8/97-8/00: Member, Standing Editorial Committee (1st term) - The International Academy for Production Engineering (CIRP).
 1/94-12/94: Chairman, ITIM-Israel Society for CAD/CAM.

Journal Referee

- The International Academy for Production Engineering (CIRP)
- CAD-Computer Aided Design
- ASME J. of Mechanical Design
- ASME J. of Manufacturing Science and Engineering,
- IEEE-PAMI (Trans. on Pattern Analysis and Machine Intelligence)
- IEEE-Comp. Graphics & Appl.
- Computers & Graphics

Editorial Boards

- 9/08-present: Editorial Board, CIRP Journal of Manufacturing Science and Technology** (<http://www.elsevier.com/locate/issn/1755-5817>)
- 1/06 – present: Honorary Editor in Chief, International Journal for Manufacturing Science and Production.**
- 11/04-present: Editorial Board, Journal of Virtual & Physical Prototyping (VPP)** (www.tandf.co.uk/journals/titles/17452759.asp)

- 1/03-12/05: Editor-in-Chief, International Journal for Manufacturing Science and Production.
- 10/02-12/10: Editorial Board, J. of Engineering Manufacture (Part B of the Proceedings of the IMechE).**
- 10/99-2003: International Journal for Manufacturing Science & Production - Assistant Editor.
- 2000: Guest Editor, Special Issue of *The International Journal for Manufacturing Science & Production*: Selected papers from 2000 International Center for Manufacturing Systems and Robotics Design Seminar on "Design with Manufacturing: Intelligent Design Concepts Methods and Algorithms," Vol 3, Nos. 2-4, 2000.
- 4/99 - 3/02: Editorial Board KSME (Korean Soc. of Mechanical Eng.) International Journal.
- 8/97-8/03: Standing Editorial Committee, The International Academy for Production Engineering (CIRP).
- 1997-present: J of CAD/CAM Applications and Modeling.
- 2006: Scientific Committee of domain experts in design methodologies, TRIZ Future Conferences (TFC), the European TRIZ Association (ETRIA) and the organizing committee of the TFC2006 Conference.
- 1/2006-present: Honorary Editor, International Journal for Manufacturing Science and Production.
- 2007-2010: Scientific Committee (Editorial) Academic Journal of Manufacturing Engineering.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- Fellow - The International Academy for Production Engineering (CIRP)
- Fellow - American Society of Mechanical Engineers (ASME)
- Fellow - The Society of Manufacturing Engineers (SME)
- Institute of Electrical and Electronics Engineers, Inc. (IEEE)
- IFIP W.G-5.2 (CAD)

HONORS AND AWARDS

- 6/2007: The WBMiZ Medal from Politechnika Poznanska, Poland
- 2007: Fellow, SME
- 2006: Fellow – ASME
- 2006: German Technion Society Prize
- 2005: Honor Advisory Professorship, Shanghai Jio Tong University
- 2004: Fellow - CIRP
- 1997: Hershel Rich Award on “Application of Artificial Intelligence in Man-Machine Interfaces”
- 1994: Alexander Goldberg Prize for Research, on “Geometrical Modeling and its Application to CAD/CAM and Manufacturing Processes”
- 1985-1988: The Elias Family Lectureship

GRADUATE STUDENTS

Completed - Ph.D. Theses

- 1992 * Anath Fischer - Extraction and Recognition of Machining Features from 3-D Geometrical Modeler (Second Advisor - Prof. A. Shavit), February 1992, Technion (Ph.D. - Technological Sciences) (1990 Recipient of Landau Award).
- 1992 * Eyal Zussman - Automatic Assembly Planning of Mechanical Products. (Principal Advisor - Prof. E. Lenz), June 1992. (Ph.D. - Mechanical Eng.) (Recipient of Gutwirth Award, 1991).
- 1997 * Baruch Radin - Fuzzy Based System for Automatic Determination of the Bending Sequence (D.Sc. - Mechanical Eng.) (Recipient of Gutwirth Award, 1995).
- 1998 * Hod Lipson - Three Dimensional Sketcher (Ph.D. - Mechanical Eng.) (Recipient of Gutwirth Award, 1995; Charles Clore Award, 1996; F. W. Taylor Medal, 1996).
- 2001 * Alina Bondarenko - Reconstruction of Moving Geometrical Shapes Based on Measurements Obtained by a Moving Sensor (Ph.D. - Mechanical Eng.) (Principal Advisor - Prof. Y. Halevi).
- 2002 * Liat Eitan (Peled) - Conversion of Boundary Representation into Constructive Solid Geometry by means of Decomposition (Ph.D. - Mechanical Eng.) (From 7/2001 – Dr. A. Fischer, Principal Advisor).

In Progress – Ph.D Theses

- * Eli Stiassnie - Adaptation of Modern Design Methods to Include Product Life-Cycle and Selling of Services Considerations.
- * Amira Sharon - A Unified Product and Project Lifecycle Model for Systems Engineering.

Completed - M.Sc. Theses

- 1983 * Chung Li Cheng - Geometrical operations based on the 3-D Karnaugh map and Boolean functions. July 1983, RPI, Troy, N.Y. (M.Sc.-**Electrical Eng.**).
- 1983 * Xin Dong - Interactive Numerical Control Program Verification - Menu Design. August 1983, RPI, Troy, N.Y. (M.Sc.-Mechanical Eng.).
- 1987 * Zeev Gal-Tzur - Integrated CAD/CAM System for Cams. (Second advisor - Prof.-S.-Malkin), February 1987, Technion. (M.Sc. - Mechanical Eng.).
- 1987 * David Chay - Redesign for Automatic Assembly. (Principal Advisor - Prof. E. Lenz) March 1987, Technion. (M.Sc. - Mechanical Eng.).
- 1987 * Gabi Ma'ayan - Interactive Numerical Control Program Verification Based Upon Switching Functions. May 1987, Technion. (M.Sc. -Mechanical Eng.).
- 1987 * Anath Letan Fischer - Geometrical Modeling Language Based on Switching Functions. July 1987, Technion. (M.Sc. -Technical Science).
- 1987 * Benny Kronengold - Graphical Simulation of a Network of Incremental Computers. July 1987, Technion. (M.Sc. -Mechanical Eng.).

- 1987 * Gershon Elber - Automatic Assembly and Disassembly of Mechanical Structures via a Solid Geometric Modeler. July 1987, Technion. (Second advisor - Prof. E. Lenz) (M.Sc.-**Computer Science**).
- 1987 * Yossef Srour - An automatic Computerized Representation of Diamonds for Optimizing the Cutting Procedure. (Principal Advisor - Prof. Y. Yarnitzky), July 1987, Technion. (M.Sc. - Mechanical Eng.).
- 1991 * Roni Rave - Optimization of the Beauty of Diamonds (Principal Advisor - Prof. Y. Yarnitzky) April 1991, Technion. (M.Sc. - Mechanical Eng.) (Recipient of Gutwirth Award, 1991).
- 1992 * Ronit Schneor - Cutting and Punching of Sheet Metal Layouts, May 1992, Technion (M.Sc. - Mechanical Eng.) (Recipient of Gutwirth Award, 1991).
- 1992 * Anthony Blumfield - Generator for Adaptive Post Processors and Simulators for CNC Machines, June 1992, Technion (M.Sc. - Mechanical Eng.) (Recipient of Gutwirth Award, 1992).
- 1992 * Miri Weiss - Shape Averaging for Industrial Design, Nov. 1992, Technion (M.Sc. - Mechanical Eng.) (Recipient of Gutwirth Award, 1993).
- 1993 * Dror Sadan - Bending Sequence and Tool Selection for Sheet Metal Product Manufacturing, July 1993, Technion. (M.Sc. - Mechanical Eng.).
- 1993 * Yuval Shoshani - Numerical Control Part Programs Simulation and Verification (Second Advisor - Prof. E. Lenz), November 1993, Technion. (M.Sc.-Mechanical Eng.).
- 1994 * Ziv Balfer - Parametric and Variational Design of Two Dimensional Geometry, May 1994, Technion. (M.Sc. - Mechanical Eng.).
- 1995 * Guy Mendelsohn - Robot Aided Removal of Sheet Metal Products, 1995, Technion. (Second Advisor Dr. M. Shoham) (M.Sc. - Mechanical Eng.).
- 1997 * Pavel Kagan - Surface Design with Geometrical and Physical Constraints (Principal Advisor Dr. Anath Fischer) (M.Sc. - Mechanical Eng.).
- 1997 * Maor Schaal - Understanding and Modeling of a Scanned Graph (Second Advisor Prof. S. Braun) (M.Sc. - Mechanical Eng.). .
- 1997 * Leonid Fuigelman - Surface Representations in CAD (M.Sc. - Mechanical Eng.).
- 1997 * Michael Viener - Curves and Surfaces in Reverse Engineering (M.Sc. - Mechanical Eng.). (Replacing advisor : Prof. Y. Halevi)
- 1998 * Alon Wolf - Placement of Visual Sensors for Robotic Assembly/Disassembly (Principal Advisor Dr. E. Zussman) (M.Sc. - Mechanical Eng.).
- 1999 * Tamar Shlaski - A Variational Based Interface for Sheet Metal Layout Design (M.Sc. - Mechanical Eng.).
- 2001 * Ron Bar-Or – Application of Augmented Reality to Manufacturing (M.Sc. – Mechanical Eng.).
- 2001 * Paul Marcovici - Automatic Recognition of Manipulative Hand Movements (M.Sc. - Mechanical Eng.) (Principal Advisor - Dr. Miriam Zackenhause).

- 2003 * Yuval Keren – Conversion of Variational Geometry into Geometrical Construction Problems (M.Sc. – Mechanical Eng.).
- 2005 * Vadim Remennik - Principal Production Lines in Reconfigurable Manufacturing Systems (M.Sc. – Mechanical Eng.).
- 2006 * Yehoshua Hazbany - Parallel Mixed-Model Assembly Lines as a Tool for Utility Improvement and Cost Reduction (Industrial Engineering, principal advisor Prof. I. Gilad).
- 2007 * Gil Guttman - Production Life Cycle: Knowledge Classification and Organization (M.Sc. – Mechanical Eng.).
- 2007 * Eli Stiassnie - Adaptation of modern design methods to include product life-cycle and selling of services considerations (M.Sc. – Mechanical Eng.).

RESEARCH GRANTS

- 6/81-7/83: R.P.I. Center for Manufacturing, Rensselaer Polytechnic Institute, N.Y., Principal Investigator and Project Manager in Research project for Boeing Company.
Subject: Numerical Control Program Verification.
(Phase I, 1981/82; Phase II 1982/83).
- 1987: Software development for SORBA-Holland. (790-323)
Subject: Metal Sheet Bending - Graphical System (Phase I), 1987
Budget: \$30,000
- 1/88 - 7/90: Stiftung Volkswagenwerk. (033-846)
Subject: Combined Geometric Modeler, 1/88-7/90.
(Joint Project with IWF Technical University of Berlin)
Budget: DM 270,000
- 1988 - 1990: SORBA, Holland. (6-030-005)
Subject: Origami-CAD System for the Sheet Metal Industry (Phase II).
- 11/89 - 11/91: SORBA, Holland. (033-880)
Subject: Integration between Designers and Subcontractors.
- 1990 - 1992: SORBA, Holland. (6-030-005)
Subject: Origami-CAD System for the Sheet Metal Industry-Phase III
Total Sorba Budget (previous 3 items): > \$500,000
- 1/92 - 12/94: Amada Metrecs, Japan (6-030-09)
Subject: Software for CIM in Sheet Metal Processing
Budget: \$1,200,000
- 2/96 - 8/99: Israel-Korea Joint Research (033-035)
(other P.I.: E. Lenz, A. Fischer)
Subject: Geometric Modeling and Rapid Prototyping Applications for Concurrent Engineering
**Budget: First Year - NIS 150,000
Second Year - NIS 165,000,
Third Year - NIS 175,000**

- 12/96 - 12/97 Mitchell Soref Foundation (6-030-11)
 Subject: Freehand Interaction,
 ⇒Patent has been filed. Title: Interactive Desk.
Budget: \$16,500
- 1/97 - 1/98 Alexander Goldberg Memorial Research (033-049)
 Subject: Three-Dimensional Medical Imaging from Ultrasound Cross-Sections,
Budget: \$5,000
- 10/97 - 9/00 **The Israel Science Foundation (ISF) (033-028)**
 Subject: Freehand Sketch-Based Man-Machine Interface for 3D CAD.
Budget: First Year - NIS 72,000
Second Year - NIS 76,500
Third Year - NIS 84,837
- 12/97 – 12/00: Mitchell Soref Foundation (033-057)
 Subject: Interactive Desk, 12/97 - 2001.
 ⇒Patent has been filed. Title: Interactive Desk.
Budget: \$25,000
- 10/98 – 6/00: VATAT (033-061)
 High Precision Machine Tools Performance Analysis
Budget: First Year - NIS 55,000
Second Year - NIS 100,000
- 8/03 – 8/04: GM-UMIT (033-174)
 Subject: Practical Number of Streams in Manufacturing Systems with Crossovers and no Buffers (Designs and Performances of Manufacturing Systems)
Budget: \$25,000
- 4/03 – 4/04: (033-157)
 Subject: Remote Operations
Budget: NIS 152,000
- 6/04 – 5/08:** (033-184 - 2004013)
 Subject: Virtual Research Lab for a Knowledge Community in Production (VRL-KCiP) Network of Excellence, European Union 6th Framework Programme
Budget: 6/04 – 5/05 €192,000
Total Budget €552,000
- 6/05-6/06:** The Bernard M. Gordon Center for Systems Engineering at the Technion (2005847)
 Subject: Holistic Product and Services Life Cycle Approach (The Holistic Product and Services Life Cycle Approach and Its Influence on the Modern Manufacturing Paradigm: Management, Manufacturing and End-of-Life (EOL) Systems)
Budget: \$20,000
- 1/06-12/09:** The Niedersachsen Foundation (1004734)
 Subject: Intelligent Management of Product Lifecycle Knowledge with Application to Cutting and Abrasive Processes
Budget: €112,000

11/07-10/08: The Bernard M. Gordon Center for Systems Engineering at the Technion (2009543)
Subject: Holistic design of sustainable systems with improved life cycle performance
Budget: \$50,000

SIGNIFICANT PROFESSIONAL PROJECT

1987-1993: Development of **Origami** - A CAD/CAM System for the Sheet Metal Industry.

The development of a new concept for designing and manufacturing sheet metal products (M. Shpitalni, "A New Concept for Design of Sheet Metal Products," Annals of the CIRP, Vol. 42/1, 1993, pp. 123-126) along with many new algorithms for process planning (permission to publish from 1997) led to the development of the system. This development was supported by the Sorba Company (Holland) and later by Amada (Japan).

Being the leader of development for Amada, the largest company in the world in the sheet metal industry, is a significant highlight of my professional career. This project initiated seven graduate research and development projects (M.Sc. and Ph.D.) and provided students with the opportunity to be involved in real life manufacturing.

1977 - 1979: **Isralaser Ltd.**, Migdal Haemek (Machining by Lasers):
Cofounder and Manager.

PUBLICATIONS

Theses

- M.Sc.: "Digital Control System for a Milling Machine."
- D.Sc.: "Adaptive Control of the Electrochemical Grinding Process."

Refereed Papers in Professional Journals

Published

1. M. Shpitalni, Y. Koren, E. Lenz, "Adaptive Control of the ECG Process", CIRP Annals, Proceedings on Manufacturing Systems, Vol. 7, No. 3, 1978.
2. E. Lenz, A. Schachrai, M. Shpitalni, "An Automatic Laser Beam System for Producing Holes in Polyethylene Irrigation Pipes", WT'1Z Ind. Fertig. 69 (1979), pp. 621-623.
3. M. Shpitalni, Y. Koren, E. Lenz, "Adaptive Control System for Optimizing the ECG Process Under the Overcut Constraint", Annals of the CIRP, Vol. 30/1/81, pp. 97-102.
4. M. Shpitalni, "A Double Loop Adaptive Control System for the ECG Process", Trans. Section of the North American Manufacturing Research Proceedings, 1983, pp. 29-35.
5. M. Shpitalni, "Switching Functions and Solid Geometrical Modeler", Proceedings of the IEEE, (Proc. Letter), December 1983, pp. 136-137.

6. M. Shpitalni, "Switching Function Based Representation - an Alternative to Quadtree Encoding for Manufacturing Systems", *Annals of the CIRP*, Vol. 34/1/85, pp. 163-167.
7. M. Shpitalni, "A Theoretical Examination of Switching Functions for Solid Modeling Data Structures," *Trans. of ASME J. of Eng. for Ind.*, February 1986, Vol. 108, pp. 27-35, Paper No. 85-WA/PROD-13.
8. M. Shpitalni, G. Ma'ayan, "Manipulations and Transformations of Objects Represented via Switching Functions for Manufacturing Applications", *Annals of CIRP*, Vol. 35/1, 1986, pp. 79-82.
9. Z. Gal-Tzur, M. Shpitalni, S. Malkin, "Integrated CAD/CAM System for Cams", *Annals of CIRP*, Vol. 35/1, 1986, pp. 99-102.
10. M. Shpitalni, "The Relations and Transformations between Quadtree Encoding and Switching Function Representation", *CAD-Computer Aided Design*, Vol. 19, No. 5, June 1987, pp. 266-272.
11. M. Shpitalni, G. Ma'ayan, A. Letan, "Switching Function Based Geometrical Modeling Language and its Application to Numerical Control Program Verification", *Annals of CIRP* Vol. 36/1, 1987, pp. 73-76.
12. M. Shpitalni, "Automatic Manufacturing via Solid Modeling"- A Theoretical Examination, *CIRP Research Note*, *Annals of CIRP*, Vol. 36/2, 1987, pp. 553-4.
13. G. Davidov, M. Shpitalni, A. Shavit, Y. Koren, "A General Algorithm for Identification of Rapidly Time-Varying Systems", *Proceedings of the IEEE*, (Proc. Letter), Vol. 75, No. 8, August 1987, pp. 1129-1130.
14. G. Elber, M. Shpitalni, "Octree Generation via Constructive Solid Geometry Definition", *Visual Computer*, Vol. 4, No. 2, July 1988, pp. 53-64.
15. D. Chay, E. Lenz, M. Shpitalni, "Picking the Parameters to Ease Automation of Assembly", *Assembly Automation*, Vol. 8, No. 3, August 1988, pp. 151-154.
16. M. Shpitalni, G. Elber, E. Lenz, "Automatic Assembly of Three Dimensional Structures via Connectivity Graphs", *Annals of CIRP*, Vol. 38/1, 1989, pp. 25-28.
17. M. Shpitalni, P. Bar-Yoseph, "Finite Element Mesh Generation via Switching Function Representation", *J. of Finite Elements in Analysis and Design*, Vol. 5, No. 2, July 1989, pp. 119-130.
18. Z. Gal-Tzur, M. Shpitalni, S. Malkin, "Design and Manufacturing Analyses for Integrated CAD/CAM of Cams", *Trans. of ASME, J. of Eng. for Industry*, Vol. 111, Nov. 1989, pp. 307-314.
19. G. Spur, F. -L. Krause, R. Li, E. Lenz, M. Shpitalni, A. Fischer, "Multirepresentation Based Geometrical Modeler", *Annals of CIRP*, Vol. 39/1, 1990, pp. 141-144.
20. E. Zussman, E. Lenz, M. Shpitalni, "An Approach to the Assembly Planning Problem", *Annals of CIRP*, Vol. 39/1, 1990, pp. 33-36.
21. M. Shpitalni, A. Fischer, "A Multirepresentation System as a Tool for Extraction of Machining Features", *Annals of the CIRP*, Vol. 40/1, 1991, pp. 157-160.

22. A. Fischer, M. Shpitalni, "Accelerating the Evaluation of Volumetric Modelers by Manipulating CSG Trees and DAGs", CAD-Comp. Aided Design, Vol. 23, No. 6, July/Aug. 1991, pp. 420-434.
23. A. Blumfield, M. Shpitalni, E. Lenz, "A Generator for Creating Adaptive Post Processors", Annals of the CIRP, Vol. 41/1, 1992, pp. 527-530.
24. A. Fischer, I. Gilboa, M. Shpitalni, "A Polynomial Algorithm for Minimal Interval Representation," J. of Algorithms, Vol. 13, 1992, pp. 546-563.
25. M. Shpitalni, "A New Concept for Design of Sheet Metal Products", Annals of the CIRP, Vol. 42/1, 1993, pp. 123-126.
26. M. Shpitalni, A. Fischer, "Separation of Disconnected Machining Regions on the Basis of a CSG Model", CAD-Comp. Aided Design, Vol. 26, No. 1, January 1994, pp. 46-58.
27. M. Shpitalni, D. Sadan, "Automatic Determination of Bending Sequence in Sheet Metal Products," Annals of the CIRP, Vol. 43/1, 1994, pp. 23-26.
28. M. Shpitalni, Y. Koren, C.C. Lo, "Real Time Curve Interpolators", CAD-Comp. Aided Design, Vol. 26, No. 11, 1994, pp. 832-838.
29. H. Lipson, M. Shpitalni, "A New Interface for Conceptual Design Based on Object Reconstruction from a Single Freehand Sketch," Annals of the CIRP, Vol. 44/1, 1995, pp. 133-136. ****(F.W. Taylor Medal Award)****
30. P. Kagan, A. Fischer, M. Shpitalni, "Intuitive Physical-based CAD System for Designing of Sculptured Surfaces," Annals of the CIRP, Vol. 45/1, 1996, pp. 121-124.
31. H. Lipson, M. Shpitalni, "Optimization-Based Reconstruction of a 3D Object from a Single Freehand Line Drawing," CAD-Comp. Aided Design, Vol. 28, No. 8, 1996, pp. 651-663.
32. M. Shpitalni, V. Manevich, "Optimal Orthogonal Subdivision of Rectangular Sheets", Trans. of ASME J. of Manufacturing Science and Engineering, Vol. 118, August 1996, pp. 281-288.
33. M. Shpitalni, H. Lipson, "Identification of Faces in a 2D Line Drawing Projection of a Wireframe Object," IEEE Trans. on Pattern Analysis and Machine Intelligence (PAMI), Vol. 18, No. 10, October 1996, pp. 1000-1012.
34. M. Shpitalni, H. Lipson, "Classification of Sketch Strokes and Corner Detection Using Conic Sections and Adaptive Clustering," Trans. of ASME J. of Mechanical Design (Technical Brief), Vol. 119, No. 1, March 1997, pp. 131-135.
35. M. Shpitalni, H. Lipson, "Automatic reasoning for design under geometric constraints," Annals of the CIRP, Vol. 46/1, 1997, pp. 85-89.
36. B. Radin, M. Shpitalni, "Two-Stage Algorithm for Rapid Determination of the Bending Sequence in Sheet Metal Product," Trans. of ASME J. of Mechanical Design, Vol. 119, No. 2, June 1997, pp. 259-266.
37. H. Lipson, M. Shpitalni, "On the Topology of Sheet Metal Parts," Trans. of ASME Journal of Mechanical Design, Vol. 120, No. 1, March 1998, pp. 10-16.

38. M. Shpitalni, L. Alting, A. Bilberg, "Practical aspects of CALS in design and manufacturing of sheet metal products", *Annals of the CIRP*, Vol. 47/1, 1998, pp. 393-396.
39. F. Kimura, H. Lipson, M. Shpitalni, "Engineering Environments in the Information Age: Research Challenges and Opportunities" *Annals of the CIRP*, Vol. 47/1, 1998, pp. 87-90.
40. M. Shpitalni, B. Radin, "Critical Tolerance Oriented Process Planning in Sheet Metal Bending," *Trans. of ASME Journal of Mechanical Design*, Vol. 121, March 1999, pp. 136-144.
41. S. C-Y. Lu, M. Shpitalni, R. Bar-Or, R. Gadh, "Virtual and Augmented Reality Technologies for Product Realization," (**Keynote Paper**), *Annals of the CIRP*, Vol. 48/2, 1999, pp.471-495.
42. D. Dutta, M. Shpitalni, "Heterogeneous Solid Modeling for Layered Manufacturing," *Annals of the CIRP*, Vol. 49/1, 2000, pp. 109-112.
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5. M. Shpitalni, "Numerical Control Tape Verification", Second Intermediate Report, April 1982 (TR-CMP-023-82-002). (47 pages).
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7. X. Dong (Graduate Student), M. Shpitalni, "Menu Network for Interactive Numerical Control Program Verification", April 1983, (TR-CMP-83-23-004), RPI Troy, New York. (65 pages).
8. C. Cheng (Graduate Student), M. Shpitalni, "Microprocessor Z-8000 Implementation of Boolean Subtraction", April 1983. (TR-CMP-83-23-005), RPI Troy, N.Y.(17 pages).
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11. E. Lenz, M. Shpitalni, A. Fischer, V. Leikehman, D. Bossin, Intermediate Report on Geometrical Modeling via Switching Functions, January 1989 (TR-CG&C-89-101) (55 pages).
12. G. Spur, F. -L. Krause, M. Remy, E. Lenz, M. Shpitalni, A. Fischer, Final Report on Geometrical Modeling via Switching Functions, April 1991.
13. M. Shpitalni, 3D Software In Sheet Metal Processing CIM, ORIGAMI/J, Project No. 6-030-09-1, Submitted to Amada Metreco Co. Ltd., November 1992.
14. M. Shpitalni, 3D Software In Sheet Metal Processing CIM, ORIGAMI/J, Project No. 6-030-09-2, Submitted to Amada Metreco Co. Ltd., December 1993.
15. A. Fischer, M. Shpitalni, E. Lenz, “”Geometric Modeling and Rapid Prototyping Applications for Concurrent Engineering” (Intermediate Report - 1996), Submitted to The Israeli Ministry of Science and the Arts, Number 6121-1-95.
16. V. Manevich, M. Vainer, L. Foigelman, M. Shpitalni, “Surface Fitting Under Constraints” (TME Report 444, November 1996).
17. M. Shpitalni, V. Manevich, L. Foigelman, “Use of Convolution for Approximation of Experimental Points by Curves and Surfaces” (TME Report 445, 1997).
18. V. Manevich, M. Shpitalni, “New Algorithm for Four-Color problem” (TME Report 446, January 1997).
19. M. Shpitalni, “Man-Machine Interface for Three-Dimensional CAD Based on Freehand Sketching”, Intermediate Report (266/97 - 10.5 - 10/97 - 3/99) submitted to The Israel Science Foundation, April 1999.

Book Chapters

1. M. Shpitalni, “Off Machine NC Verification”, Book Chapter in C. LeMaistre, A. El-Sauy, Computer Integrated Manufacturing - A System Approach, UNIPUB/Kraus International Publication, 1987.
2. M. Shpitalni, H. Lipson, “Product Development and CAD/CAM”, Book Chapter in E. Uhlmann and F.-L. Krause, Innovative Product Technology , Verlag (publisher), 1998, pp 313-323.
3. M. Shpitalni (Editor), Proceedings of the 2000 CIRP International Design Seminar, Design with Manufacturing - Intelligent Design Concepts Methods and Algorithms, 16-18/5/2000, **Haifa, Israel**.
4. H. Bley, H. Jansen, F.-L. Krause, M. Shpitalni (Editors), Proceedings, Advances in Methods and Systems for Products and Processes, 2. German-Israeli Symposium for Design and Manufacture, July 7-8, 2005, ISBN: 3-8167-6874-1.
5. G. Molcho and M. Shpitalni, “A business-oriented approach to the product life cycle,” chapter in *Innovation in Life Cycle Engineering and Sustainable Development*, edited by D. Brissaud, S. Tichkiewitch and P. Zwolinski, Springer (publisher), 2005, ISBN: 1-4020-4601-4, pp. 17-32.

Other Publications:

1. V. Manevich, M. Shpitalni, I. Hartman, "On the Four Color Problem", *Etgar*, September 1995, pp. 28-32 (Hebrew).
2. V. Manevich, M. Shpitalni, U. Benchetrit, "Bi-arc Interpolation," *Etgar*, May 1996, pp. 30-32 (Hebrew).

CONFERENCES

Plenary Talks

1. "Product Development and CAD/CAM", Special Colloquium Innovative Production Technology (in honor of Prof. G. Spur) **Berlin, Germany**, October 28, 1998.
2. "Man-Machine Interfaces for CAD", 6th International Workshop on Geometrical Modeling, IFIP TC5/WG5.2, **Tokyo, Japan**, 4-7/12/1998.
3. **CIRP KEYNOTE PAPER (1999), together with Prof. S. Lu, on the subject:** Virtual and Augmented Reality Technologies for Product Realization, CIRP General Assembly - August 99 (Switzerland).
4. "How many Machining System Configurations Exist?" Special Symposium in honor of Prof. Krause on Virtualisation of Product Development, **Berlin, Germany**, April 26, 2002.
5. "Impact of Life Cycle Approach and Selling of Services on Product Design", Manufacturing '04 Conference, **Poznan, Poland**, November 4-5, 2004.
*Also appears in: Archives of Mechanical Technology and Automation, Vol. 24, No. 2 (Special Issue), pp. 251-261.
6. "Counting Manufacturing Systems", VIDA 2007, 28-29/6/07, **Poznan, Poland**.

Contributed Talks

1. "Adaptive Control System for Optimizing the ECG Process under the Overcut Constraint", 31st General Assembly of CIRP, Toronto, Canada, 8/30/81-9/5/81.
2. "A Double Loop Adaptive Control System for the ECG Process", SME 50th Anniversary, Philadelphia, Penn., 5/17/82-5/20/82.
3. "A Solid Geometrical Modeler Oriented to Performing Set Operations", The International Conference on the Factory of the Future, 6th Conference of the Israel Society for CAD/CAM and the Annual Meeting of CASA/SME, Tel-Aviv, 4-7/11/1984.
4. "The Relations and Transformations between Quadtree Encoding and Switching Function Representation", SIAM (Soc. for Industrial and Applied Mathematics), Conference on Geometric Modeling and Robotics, Albany, N.Y., 15-19/7/1985.
5. "Switching Function Based Representation - An Alternative to Quadtree Encoding for Manufacturing Systems", 35th General Assembly of CIRP, 24-28/8/85, Palermo, Italy, pp. 163-167.
6. "A Theoretical Examination of Switching Functions for Solid Modeling Data Structures", ASME 1985 Winter Annual Meeting, 17-22/11/1985, Miami Beach, Florida.

7. "Manipulations and Transformations of Objects Represented via Switching Functions for Manufacturing Applications", 36th General Assembly of CIRP, Jerusalem, 17-22/8/1986.
8. "Automatic Manufacturing via Geometrical Modeling Languages - A Theoretical Examination", 37th General Assembly of CIRP-Dubrovnik, Yugoslavia (STC-Design), August 17-23, 1987.
9. "Automatic Assembly of Three Dimensional Structures via Connectivity Graphs," 39th General Assembly of CIRP, Trondheim, Norway, 20-26/8/1989.
10. "An Overview of Switching Function Based Representations", International GI/IFIP-Symposium 89 on Advanced Geometric Modeling for Engineering Applications, Berlin, W. Germany, 8-10/11/89.
11. "Multirepresentation Based Geometrical Modeler", 40th General Assembly of CIRP, Berlin, W. Germany, 26/8-2/9/90.
12. "A New Concept for Design of Sheet Metal Products", 43rd General Assembly of CIRP, Edinburgh, Scotland, 23-28/8/93.
13. "Automatic Determination of Bending Sequence in Sheet Metal Products", 44th General Assembly of CIRP, Singapore, 21-27/8/94.
14. "An Interface for 3D Conceptual Design Based on Freehand Sketching," IFIP WG5.2 Workshop on Geometric Modeling in Computer Aided Design, Airlie, Virginia, USA, 18-23/5/96.
15. "Conceptual Design of Sheet Metal Products by Sketching", SheMet 1988, The 6th International Conference on Sheet Metal, April 6-8, 1988, Enschede, Holland.
16. "An Expert System for Sheet Metal Tool Assignment", CIRP International Seminar on Intelligent Computation in Manufacturing Engineering, ICME 98, July 1-3, 1998, Capri, Italy.
17. "Practical aspects of CALS in design and manufacturing of sheet metal products", 48th General Assembly of CIRP, Athens, Greece, 23-29/8/98.
18. "Engineering Environments in the Information Age: Research Challenges and Opportunities", 48th General Assembly of CIRP, Athens, Greece, 23-29/8/98.
19. "Practical Number of Paths in Reconfigurable Manufacturing Systems with Crossovers", CIRP 2nd International Conference on Reconfigurable Manufacturing, Ann Arbor, Michigan, USA, 19-21/8/2003.
20. "Multiresolution Representation of 2D CSG Models", 53rd General Assembly of CIRP, Krakow, Poland, August 22-27, 2004.
21. "Product Lifecycle, Selling of Services and Advances in Product Measuring Devices", 2004 Israel-Italy Bi-National Conference on Measurements and Uncertainty Evaluation in Coordinate Measuring Machine (CMM) and Scanners and their Implication on Design and Reverse Engineering, Haifa, Israel, November 29-30, 2004.
22. "Linear Programming and Genetic Algorithms Methods for Creation of Groups in Networks of Excellence," CIRP 55th General Assembly, Kobe, Japan, 20-26 August 2006.

Invited Seminars

1. "Geometrical Modeler Based upon Switching Functions as an Alternative to Octree Encoding", Seminar, Institute of Mathematics and Computer Science, **The Hebrew University, Jerusalem**, February 4, 1985.
2. "Octrees, Listing Methods and Switching Function Based Representations", **Technical University of Berlin, W. Germany**, March 19, 1985.
3. "Solid Geometric Modeler Based Upon Representation of Objects via Switching Functions", Mechanical Engineering Colloquium, **Columbia University, N.Y.**, April 29, 1986.
4. "Automatic Assembly: Can it Work for Automatic Machining", Mechanical Engineering Seminar, **University of Massachusetts, Amherst, MA**, February 3, 1988.
5. "Automatic Assembly and Automatic Machining", Schlesinger Seminar, Technion, Haifa, November 24, 1988.
6. "Solid Modelers and their Role in Integrated Design and Manufacturing", Brazil-Israel Seminar, **Sao Paulo, Brazil**, June 23-28, 1991.
7. "Era of Modern Manufacturing - Prospects of Machine Builders" at **Amada Metrecs, Japan**, 5-9/10/91.
8. "Design with Origami" at **Amada Metrecs, Japan**, 30/11-5/12/92.
9. "A New Concept for Designs of Sheet Metal Products" at **Amada Metrecs, Japan**, 5/93.
10. "Techniques in Parametric and Variational Design," SME Seminar, Tel Aviv, November 22, 1993 (the only lecture at the seminar).
11. "Parametric and Variational-Based Geometry for Design," Computing Center, Czech Technical University, **Prague**, March, 1994.
12. "Parametric and Variational Design in Computational Geometry," Faculty of Mechanical Eng., Technical Univ., **Brno**, March, 1994.
13. "Automatic Determination of Bending Sequence in Sheet Metal Products" at **Amada Metrecs, Japan**, 1-3/6/94.
14. "Conversion of 2D Boundary Representation into CSG Model." University of Naples, **Napoli, Italy**, May 30, 1997.
15. Special Seminar on "Design and Manufacturing of Sheet Metal Products," Politecnico Di Torino, **Torino, Italy**, June 5, 1997.
16. "Virtual and Augmented Technologies and their Application to Maintenance", University of Tokyo and Japan Railways, **Tokyo, Japan** March 26, 2000.
17. "On Counting Machining System Configurations", M. Shpitalni , Dept. of Mechanical Eng., University of Michigan, **Ann Arbor, Michigan**, April 12, 2002.

Others

1. Five presentations at Boeing Commercial Airplane Company, **Seattle, WA** (1/82, 4/82, 8/82, 4/83, 7/83), on the subject of “NC program verifications”.
2. “A Solid Geometrical Modeler for Performing Boolean Operations”, Conference of Mechanical Engineering, Technion, Israel, 7/1984.
3. "Knowledge Mapping and Ontology", VRL-KCiP First General Assembly, Grenoble, France, 9-11/6/2004.
4. "Mapping Knowledge", VRL-KCiP Knowledge Management Working Group Meeting, Troyes, France, 19-20/7/2004.
5. "Internal Communication and Project Management Tool", VRL-KCiP Orientation Board Meeting, Poznan, Poland, 22-29/2004.

Refereed Papers in Conference Proceedings

Published

1. M. Shpitalni, “A Double Loop Adaptive Control for the ECG Process”, SME 50th Anniversary, **Philadelphia**, May 17-20, 1982.
*(Has been selected as one of the outstanding publications of the year).
2. M. Shpitalni, C.L. LeMaistre, “The Problem of Numerical Control Program Verification - Analysis and Approach”. Proc. of the **ASME** Winter Annual Meeting, Symposium on Computer Integrated Manufacturing III, November 1983.
3. M. Shpitalni, “A Solid Geometrical Modeler for Performing Boolean Operations”, Conference of Mechanical Engineering, Technion, Israel, July, 1984. (Extended abstract).
4. M. Shpitalni, C.L. LeMaistre, “NC Part Program Verification and Preparation via Computer Graphics”, Conference of Mechanical Engineering, Technion, Israel, July, 1984 (Extended abstract).
5. M. Shpitalni, “A Solid Geometrical Modeler Oriented to Performing Set Operations”, The International Conference on the Factory of the Future, 6th Conference of the Israel Society for CAD/CAM and the Annual Meeting of CASA/SME, Tel Aviv, November 4-7, 1984 (Extended abstract).
6. M. Shpitalni, “The Relations and Transformations between Quadtree Encoding and Switching Function Representation”, **SIAM** (Soc. for Industrial and Applied Mathematics) Conference on Geometric Modeling and Robotics, **Albany N.Y.**, July 15-19, 1985 (Extended abstract).
7. G. Ma’ayan, M. Shpitalni, “Representation of the Complementary of a Rectangle via Switching Functions”, 7th Conference of the Israel Soc. for CAD/CAM and Robotics and Annual Meeting of CASA/SME, Tel-Aviv, November 19-21, 1985 (Extended abstract).

8. Z. Gal-Tzur, M. Shpitalni, S. Malkin, "Integrated CAD/CAM System for Cams", 7th Conference of the Israel Soc. for CAD/CAM and Robotics and Annual Meeting of CASA/SME, Tel-Aviv, November 19-21, 1985 (Extended abstract).
9. Z. Gal-Tzur, M. Shpitalni, S. Malkin, "Integrated CAD/CAM System for Cams", Conference of Mechanical Eng., June 23, 24, 1986, Tel-Aviv (Extended abstract).
10. D. Chai, E. Lenz, M. Shpitalni, "Evaluation tool: for Design for Automatic Assembly", 8th Conference of Israel Soc. for CAD/CAM and Robotics and Annual Meeting of CASA/SME, Tel-Aviv, 2-4 Dec. 1986, pp. 5.2.2, 1-5.
11. G. Elber, M. Shpitalni: "A Solid Modeler Based on Octree Encoding", 8th Conference of Israel Soc. for CAD/CAM and Robotics and Annual Meeting of CASA/SME, Tel-Aviv, 2-4 Dec. 1986, pp. 6.2.3 1-10.
12. M. Armelin, M. Shpitalni, E. Lenz, "Automatic Design of Fixturing Systems", 9th Conference of Israel Soc. for CAD/CAM and Robotics and Annual Meeting of CASA/SME, Tel-Aviv, December 1-3, 1987.
13. S. Shifrin, E. Lenz, M. Shpitalni, "Interfacing a CAD Software with a Machine Tool", The Israel Convention on CAD/CAM, Robotics, A.I., Vision and Pattern Recognition. Tel-Aviv, 27-29 December, 1988.
14. M. Shpitalni, "An Overview of Switching Function Based Representations", International **GI/IFIP** Symposium 89 on Advanced Geometric Modeling for Engineering Applications, (F. -L. Krause, H. Jansen, Editors), **Berlin**, November 8-10/, 1989, pp. 45-62.
*Also appears in North-Holland's book, *Advanced Geometric Modelling for Engineering Applications*, F. -L. Krause, H. Jansen, Editors, 1990, pp. 55-72.
15. M. Shpitalni, Z. Gal-Tzur, "Origami - A CAD/CAM System for Sheet Metal Products", Conference on Data-Driven Manufacturing, The Israel Soc. for CAD/CAM and SME, Tel Aviv, April 30 - May 2, 1991.
16. A. Fischer, M. Shpitalni, "Encoding and Recognition of Features by Applying Curvature and Torsion Criteria to Boundary Representation", **ASME** 1992 Winter Annual Meeting, Symposium on Concurrent Engineering, **Anaheim**, CA, November 8-13, 1992, pp. 69-84.
17. M. Weiss, M. Shpitalni, "Design by Interpolation", Seventh Annual **IEEE** European Computer Conference, **Paris-Evry**, France, May 24-27, 1993, pp. 201-209.
18. Y. Koren, C.C. Lo, M. Shpitalni, "CNC Interpolators: Algorithms and Analysis", **ASME**, Winter Annual Meeting, Symposium of Computer-Controlled Machines for Manufacturing, CAD/CAM Integration and Modern Controller Design, **New Orleans, U.S.A.**, November 28-December 3, 1993.
19. G. Mendelsohn, M. Shpitalni, M. Shoham, "Robot Assisted Removal of Sheet Metal Products," Conference of Mechanical Engineering, Haifa, May 25-26, 1994.
20. H. Lipson, M. Shpitalni, "An Interface for 3D Conceptual Design Based on Freehand Sketching," CIEME, Israel-Germany Bi-National Conference on Computer Integrated Extended Manufacturing Enterprise, February 28-29, 1996, Herzilia, Israel. Proceedings of the CIEME, pp. 141-150.

21. H. Lipson, M. Shpitalni, "Decomposition of a 2D Polygon into a Minimal Set of Disjoint Primitives," Proceedings of the CSG96 Conference, **Winchester, UK**, 17-19 April, 1996, pp. 65-82.
22. H. Lipson, M. Shpitalni, "An Interface for 3D Conceptual Design Based on Freehand Sketching", **IFIP WG5.2** Workshop on Geometric Modeling in Computer-Aided Design, **Airlie, Virginia, USA**, May 18-23, 1996.
*Also appears in "Product Modeling for Computer Integrated Design and Manufacture" (M. Pratt, R.D. Sriram, M.J. Wozny, Editors), North Holland, 1996, pp. 139-148.
23. A. Fischer, P. Kagan, P. Bar-Yoseph, M. Shpitalni, "A B-Spline Finite Element Technique for Designing 3D Sculptured Surfaces", **IFIP WG5.2** Workshop on Geometric Modeling in Computer-Aided Design, **Airlie, Virginia, USA**, May 18-23, 1996.
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24. H. Lipson, M. Shpitalni, "An Interface for 3D Conceptual Design Based on Freehand Sketching," (Extracts from the CIEME Proceedings, see no. 20), 25th Israel Conference on Mechanical Engineering, Haifa, May 1996, pp. 26-29.
25. B. Radin, M. Shpitalni, I. Hartman, "Two Stage Algorithm for Rapid Determination of the Bending Sequence in Sheet Metal Products," #96-DETC/DAC-1037, Proce. of the 1996 **ASME** Design Automation Conference, **Irvine, California, USA**, pp. 1-12, August 1996.
26. B. Radin, M. Shpitalni, "Bending Sequence Optimization Subject to Critical Tolerance Constraints in Sheet Metal Bending," Second World Congress on Intelligent Manufacturing Processes and Systems, **Budapest, Hungary**, June 10-13, 1997, pp. 236-241.
27. H. Lipson, M. Shpitalni, "Conceptual Design of Sheet Metal Products by Sketching", SheMet 1998, The 6th International Conference on Sheet Metal, April 6-8, 1998, **Enschede, Holland**, pp. 171-180.
28. H. Lipson, M. Shpitalni, F. Kimura, "On Solving Variational Geometry by Auxiliary Constructions", 26th Israel Conference on Mechanical Engineering, Haifa, May 1998.
29. H. Lipson, M. Shpitalni, F. Kimura, I. Goncharenko, "Online Product Maintenance by Web-Based Augmented Reality", CIRP Seminar STC Design on "New Tools and Workflows for Product Development", May 14-15, 1998, **Berlin, Germany**, pp. 131-143.
30. M. Shpitalni, F. Kimura, I. Goncharenko, S. Kato, H. Lipson, "Total Maintenance: Scope and Tools", CIRP Seminar STC Design on "New Tools and Workflows for Product Development", May 14-15, 1998, **Berlin, Germany**, pp.81-92.
31. M. Shpitalni, R. Schneor, "An Expert System for Sheet Metal Tool Assignment", CIRP International Seminar on Intelligent Computation in Manufacturing Engineering, ICME 98, July 1-3, 1998, **Capri, Italy**, pp. 163-170.
32. Y. Keren, M. Shpitalni, "Application of Reflections For Converting Variational Geometry to Parametric Geometry", 2000 CIRP International Design Seminar,

- Design with Manufacturing - Intelligent Design Concepts Methods and Algorithms, 16-18/5/2000 **Haifa, Israel**, pp. 353-358.
33. M. Shpitalni, Y. Keren, "Converting Variational Geometry to Parametric Geometry by Auxiliary Constructions", 8th Israel Conference on Mechanical Engineering, June 14, 2000, **Beer Sheba, Israel**, p. 215.
 34. M. Shpitalni, R. Bar-Or, "Virtual and augmented reality technologies for product realization," 28th Israel Conference on Mechanical Engineering, June 14, 2000, **Beer Sheba, Israel**.
 35. H. Lipson, M. Shpitalni, "Correlation-based reconstruction of a 3D object from a single freehand sketch", 2002 AAAI Spring Symposium on Sketch Understanding, pp. 99-104, AAAI Press, **Menlo Park, CA, USA**.
 36. T. Freiheit, V. Maier-Speredelozzi, W. Zhong, S. J. Hu, and M. Shpitalni , " Analysis of Manufacturing System Configuration and Performance," Proceedings of the GPC_2002: Global Powertrain Conference September 24-26, 2002, **Ann Arbor MI, USA**.
 37. T. Freiheit, M. Shpitalni, S. J. Hu, "Productivity of Parallel-Serial Manufacturing Lines with and without Crossover", 2002 **ASME** Proceeding of the International Mechanical Engineering Congress and Exposition (IMCE 2002-32846), November 17-22, 2002, **New Orleans, LA, USA**.
 38. A. Bondarenko, Y. Halevi, M. Shpitalni, "Iterative Extended Kalman Filter for Systems with Non-Additive Measurement Noise", 2003 Mechanical Engineering Conference, May 12-13, 2003, Haifa, Israel.
 39. V. Remennik, M. Shpitalni, "Practical number of paths in alternative parallel lines systems (APLS) of flexible manufacturing", 2003 Mechanical Engineering Conference, May 12-13, 2003, Haifa, Israel.
 40. I. Lopatukhin, M. Shpitalni, "Errors due to deviation of the cutting tool tip from the workpiece axis of rotation in CNC lathe machining", 2003 Mechanical Engineering Conference, May 12-13, 2003, Haifa, Israel.
 41. M. Shpitalni, V. Remennik, "Practical Number of Paths in Reconfigurable Manufacturing Systems with Crossovers", CIRP 2nd International Conference on Reconfigurable Manufacturing, Paper No. A-12, August 19-21, 2003, **Ann Arbor, Michigan, USA**.
 42. A. Bondarenko, Y. Halevi and M. Shpitalni, "Object Identification and Tracking via Noise Updated Iterative Extended Kalman Filter", Proceedings of ESDA04, 7th Biennial ASME Conference on Engineering Systems Design and Analysis, July 19-22, 2004, **Manchester, United Kingdom**.
 43. M. Shpitalni, "Impact of Life Cycle Approach and Selling of Services on Product Design," Archives of Mechanical Technology and Automation, Vol. 24, No. 2 (Special Issue), 2004, pp. 251-261.
 44. G. Molcho, M. Shpitalni, "A Business-Oriented Approach to the Product Life Cycle," 30th Israeli Conference on Mechanical Engineering, 29-30 May, 2005, Tel-Aviv, Israel.

45. I. Lopatukhin, M. Shpitalni, "Recalculation of Sizes and Tolerances on Change of Measuring and Setting Bases," 30th Israeli Conference on Mechanical Engineering, 29-30 May, 2005, Tel-Aviv, Israel.
46. M. Shpitalni, G. Guttman, D. Bossin, "Creation of Project Teams in Networks of Excellence", Proceedings of the German-Israeli Symposium for Design and Manufacture on Advances in Methods and Systems for Products and Processes, Berlin, 7-8 July, 2005, pp. 3-12.
47. H. Jansen, C. Kind, F.-L. Krause, D. Langenberg, M. Shpitalni, "VRL-KCiP – Virtual Research lab for a Knowledge Community in Production", Proceedings of the German-Israeli Symposium for Design and Manufacture on Advances in Methods and Systems for Products and Processes, Berlin, 7-8 July, 2005, pp. 249-253.
48. G. Molcho, M. Shpitalni, "A Business-Oriented Approach to the Product Life Cycle – A Holistic Approach," 14th Israeli Conference on Industrial Engineering, March 20-21, 2006, Tel-Aviv, Israel.
49. E. Stiassnie, G. Molcho, M. Shpitalni, "A holistic approach to manufacturing system design," 2006 39th CIRP ISMS 2006, Ljubljana, Slovenia, 7-9 June 2006.
50. S. Hazbany, I. Gilad and M. Shpitalni, "About the Efficiency and Cost Reduction of Parallel Mixed-Model Assembly Lines," 17th CIRP International Design Seminar, Berlin, Germany, 27-28 March 2007.
51. E. Stiassnie, G. Molcho, M. Shpitalni, "Holistic Design Of Sustainable Systems With Improved Life Cycle Performance," Proceedings of the 9th Biennial ASME Conference on Engineering Systems Design and Analysis (ESDA 2008), July 7-9, 2008, Haifa, Israel.,"
52. G. Molcho, Y. Zipori, R. Schneor, P. Kowalski, B. Denkena, M. Shpitalni, "Computer Aided Manufacturability Analysis Closing the CAD-CAM Knowledge Gap," Proceedings of the 9th Biennial ASME Conference on Engineering Systems Design and Analysis (ESDA 2008), July 7-9, 2008, Haifa, Israel.
53. Zhiwu Li, M. Shpitalni, "On the Existence of a Maximally Permissive Liveness-enforcing Petri Net Supervisor for Flexible Manufacturing Systems," IEEE International Conference on Networking, Sensing and Control, 2008, ICNSC 2008, 6-8 April 2008, pp. 90-95, ISBN: 978-1-4244-1685-1.
54. Zhiwu Li, M. Shpitalni, "A Deadlock Prevention Policy for FMS Using Elementary Siphons of Petri Nets with Uncontrollable Transitions," IEEE International Conference on Networking, Sensing and Control, 2008. ICNSC 2008, 6-8 April 2008, pp. 67-72, ISBN: 978-1-4244-1685-1.

Participation in Organizing Conferences

1986: Head, Editorial & Program Committees, Israel Assoc. for CAD/CAM Conference.
 1985/6, 1986/7, 1987/8, 1988/9: Member, Directory Board of the Israel Assoc. for CAD/CAM.

- 12/1989: Editorial and Program Committees, Israel Assoc. for CAD/CAM Conference, Jerusalem.
- 8-10/11/1989: Editorial Committee, Advanced Geometrical Modeling for Engineering Applications, GI/IFIP **Berlin, Germany**.
- 21-22/2/1990: Program Committee, 31st Annual Israel Conference on Aviation and Aeronautics.
- 4-5/12/1990: Editorial Committee, CIRP International Seminar on CA-Design, **Ljubljana, Yugoslavia**.
- 30/4/91-1/5/91: Editorial Committee, Israel Assoc. for CAD/CAM Conference, Tel-Aviv.
- 20-23/5/92: International Advisory Panel, IA '92 (Industrial Automation '92), **Singapore**.
- 2-4/6/92: Editorial and Program Committees, Israel Assoc. for CAD/CAM Conference, Design and Production in the Era of Concurrent Engineering, Tel Aviv.
- 23-26/3/94: International Advisory Panel, IA '94 (Industrial Automation '94), **Singapore**.
- 13-15/4/94: International Programme Committee, CSG 94, Set-theoretic Solid Modelling: Techniques and Applications, **Winchester, England**.
- 21-23/5/95: International Program Committee, 27th CIRP International Seminar on Manufacturing Systems, **Ann Arbor, Michigan, USA**.
- 29/11-1/12/95: International Program Committee, Prolamat '95, Life Cycle Modeling for Innovative Products and Processes (IFIP), **Berlin, Germany**.
- 26/2-1/3/96: Organizing and Editorial Committee, German-Israeli Workshop on CIM in Extended Industrial Enterprise, Haifa and Tel Aviv.
- 17-19/4/96: International Programme Committee, CSG 96, Set Theoretic Solid Modeling, **Winchester, England**.
- 3-7/11/96: Head, Israeli Delegation, Hungarian-Israeli Workshop on Intelligent Manufacturing for Saving the Environment, **Budapest, Hungary**.
- 10-13/6/97: International Program Committee, Second World Congress on Intelligent Manufacturing Processes and Systems, **Budapest, Hungary**.
- 19-21/6/97: International Program Committee, International Conference and Exhibition on Design and Production of Dies and Molds, **Istanbul, Turkey**.
- 26-27/6/97: Workshop Committee, 2nd Workshop on the Methodologies for Real-World Problem Solving and Decision Making in Design of Manufacturing, **Cambridge, MA, USA**.
- 26-27/6/97: International Programme Committee, Life Cycle Networks, **Berlin, Germany**.
- 18-20/8/97: International Program Committee, 8th International Conference on Production Engineering (organized by JSPE), **Sapporo, Hokkaido, Japan**.
- 8-10/10/97: International Program Committee, 1997 International CIRP Design Seminar on Multimedia Technologies for Collaborative Design and Manufacturing, **Los Angeles, California, USA**.
- 1-3/4/98: International Programme Committee, CSG 98, Set Theoretic Solid Modeling, **Winchester, England**.

- 14-15/5/98: International Program Committee, New Tools and Workflows for Product Development, **Berlin, Germany**.
- 26-29/5/98: International Program Committee, The 4th International Seminar on Intelligent Manufacturing Systems, Theory and Practice, **Belgrade, Yugoslavia**.
- 1-3/7/98: International Program Committee, Intelligent Computation in Manufacturing Engineering, **Capri, Italy**.
- 9-11/9/98: International Program Committee, Prolamat '98, The Globalization of Manufacturing in the Digital Communications Era of the 21st Century: Innovation, Agility and the Virtual Enterprise, **Trento, Italy**.
- 28-30/10/98: International Program Committee, PTK 98, Technology Management: Regional Strengths and Global Opportunities, **Berlin, Germany**.
- 4-7/12/98: International Program Committee, 6th International Workshop on Geometrical Modeling, IFIP TC5/WG5.2, **Tokyo, Japan**.
- 24-26/3/99: International Program Committee, 1999 International CIRP Design Seminar: Integration of process Knowledge into Design Support Systems, **Enschede, The Netherlands**.
- 24-26/5/99: International Programme Committee, The 32nd CIRP International Seminar on Manufacturing Systems: New Supporting Tools for Designing Products and Production Systems, **Leuven, Belgium**.
- 6-7/12/99: International Program Committee, International Workshop on Emergent Synthesis, IWES'99, **Kobe, Japan**.
- 28-30/3/2000: International Scientific Programme Committee, MICAD 2000, **Paris, France**.
- 16-18/5/2000: **Conference Chairman and Chairman**, International Program Committee, 2000 CIRP International Design Seminar, Design with Manufacturing - Intelligent Design Concepts Methods and Algorithms, **Haifa, Israel**.
- 28-30/6/2000: International Program Committee, The Third World Congress on Intelligent Manufacturing Processes & Systems, **Cambridge, MA, USA**.
- 21-23/6/2000: International Program Committee, ICME 2000, Intelligent Computation in Manufacturing Engineering, **Capri, Italy**.
- 27-29/11/2000: International Program Committee, 7th CIRP International Seminar on Life Cycle Engineering: Life Cycle Planning, Design and Management for Eco-Products and Systems, **Tokyo, Japan**.
- 2-3/4/2001: International Advisory Committee, SheMet2001, **Heverlee-Leuven, Belgium**.
- 21-22/5/2001: International Program Committee, CIRP 1st International Conference on Reconfigurable Manufacturing, **Ann Arbor, Michigan, USA**.
- 6/2001: International Program Committee, 8th Symposium on Life Cycle Engineering, Workgroup on Life Cycle Engineering of CIRP, **Varna, Bulgaria**.
- 4-7/6/2001: International Program Committee, IEA/AIE-2001, The Fourteenth International Conference on Industrial & Engineering Applications of Artificial Intelligence & Expert Systems of the International Society of Applied Intelligence (ISAI), **Budapest, Hungary**.
- 6-8/6/2001: International Program Committee, CIRP Design Seminar on "Design in the New Economy: Design Theory, Methodology and its Integration with

- Computational Tools to Support Teams of Competence - the Road to Wealth,"
Stockholm, Sweden.
- 21-23/6/2001: International Program Committee, 2nd International Conference and Exhibition on Design & Production of Dies and Molds, Department of Mechanical Engineering, Middle East Technical University, **Izmir-Aydin, Turkey.**
- 6/2001: International Program Committee, International IFIP Conference on Feature Modelling and Advanced Design-For-The-Life-Cycle Systems, FEATS'2001, **Valenciennes, France.**
- 9-10/4/2002: Program Committee, 9th CIRP International Seminar on Life Cycle Engineering 2002, **Erlangen, Germany.**
- 9-10/5/2002: International Program Committee, The 4th International Workshop on Emergent Synthesis, IWES 02, **Kobe, Japan.**
- 13-15/5/2002: International Program Committee, 35th CIRP International Seminar on Manufacturing Systems (CIRP-ISMS 2002), special topic: "Manufacturing Technology in the Information Age", **Seoul, Korea.**
- 12-14/2/2003: Program Committee, The 4th Israel-Korea Bi-National Conference on "Geometric Modeling and Computer Graphics", Tel Aviv, Israel.
- 12-14/5/2003: International Program Committee, CIRP Design Seminar on "Methods and Tools for Co-operative and Integrated Design", **Grenoble, France.**
- 16-18/7/2003: International Program Committee, "Product Lifecycle Management", **Bangalore, India.**
- 20-22/8/2003: Organizing Committee and International Scientific Committee, "CIRP 2nd International Conference on Reconfigurable Manufacturing," **Ann Arbor, MI, USA.**
- 1-4/10/2003: International Scientific Committee, 1st International Conference on Advanced Research in Virtual and Rapid Prototyping (VRAP 2003), **Leira, Portugal.**
- 25-27/10/2003: Organizing Committee, ims2003 "Informatics and Intelligence – The New Paradigm in Maintenance", **Xi'an, China.**
- 30/6-2/7/2004: International Program Committee, ICME 2004, 4th CIRP International Seminar on Intelligent Computation in Manufacturing Engineering, **Sorrento, Italy.**
- 16-18/5/2004: International Program Committee, 2004 International CIRP Design Seminar: Design in the Global Village, **Cairo, Egypt.**
- 17-18/5/2004: Internal Programme Committee, IWES'04: The 5th International Workshop on Emergent Synthesis, **Budapest, Hungary.**
- 19-21/5/2004: International Program Committee, 37th CIRP International Seminar on Manufacturing Systems (ISMS), **Budapest, Hungary.**
- 3-4/6/2004: International Program Committee, 1st International Conference on "Virtual Design and Automation", Faculty of Mechanical Engineering and Management, Poznan University of Technology, **Poznan, Poland.**
- 19-20/7/2004: Track Leader – Manufacturing Engineering, 7th Biennial ASME Conference on Engineering Systems Design and Analysis – ESDA 2004, **Manchester, UK.**

- 1-3/9/2004: International Program Committee, 4th International Conference on e-Engineering & Digital Enterprise Technology (e-ENGDET), Leeds Metropolitan University, **Leeds, UK**.
- 13-15/10/2004: International Program Committee, UMTIK 2004, the 11th International Conference on Machine Design and Production, **Antalya, Turkey**.
- 29-30/11/2004: Chair, 2004 Israel-Italy Bi-National Conference on "Measurements and Uncertainty Evaluation in Coordinate Measuring Machine (CMM) and Scanners and their Implication on Design and Reverse Engineering", Haifa, Israel.
- 3-5/4/2005: International Scientific Committee, 12th CIRP Seminar on Lifecycle Engineering: "Innovation in Life Cycle Engineering and Sustainable Development", **Grenoble, France**.
- 6-18/5/2005: International Scientific Committee, 38th CIRP International Seminar on Manufacturing Systems, **Florianopolis, Brazil**.
- 10-12/5/2005: Scientific Committee, 3rd International CIRP Conference on Reconfigurable Manufacturing, University of Michigan, **Ann Arbor, MI, USA**.
- 22-26/5/2005: **Chairman**, International Academic Committee, 15th International CIRP Design Seminar 2005 on "New Trends in Engineering Design", Shanghai Jiao Tong University, **Shanghai, China**.
- 9/2005: Scientific Committee, VRAP 2005, **Leiria, Portugal**.
- 16-18/10/2005: International Scientific Committee, International Conference on Integrated Engineering C2I 2005, **Timisoara, Romania**.
- 28-29/11/2005: International Scientific Committee, 2nd International Conference on Virtual Design and Automation, VIDA Virtual Design and Automation Centre at the Faculty of Mechanical Engineering and Management, Poznan University of Technology, **Poznan, Poland**.
- 17-19/5/2006: International Scientific Committee, IDDME '06, 6th International Conference on Integrated Design and Manufacturing in Mechanical Engineering, **Grenoble, France**.
- 31/5-2/6/2006: International Scientific Committee, 13th International CIRP Life Cycle Engineering Seminar, **Leuven, Belgium**.
- 13-17/6/2006: International Scientific Committee, International Conference of Axiomatic Design - ICAD 2006, **Florence, Italy**.
- 27-30/6/2006: International Program Committee, International Conference on Industrial and Engineering Applications of Artificial Intelligence & Expert Systems (IEA/AIE), **Annecy, France**.
- 16-19/7/2006: International Scientific Committee, 2006 CIRP Design Seminar on Design & Innovation for Sustainable Society, **Kananaskis (near Calgary), Canada**.
- 25-28/7/2006: International Program Committee, CIRP ICME '06, 5th CIRP International Seminar on Intelligent Computation in Manufacturing Engineering, **Ischia, Italy**.
- 16-18/8/2006: International Program Committee, 11th ICPE-Toward Synthesis of Micro/Nano Systems, **Tokyo, Japan**.
- 18-19/8/2006: International Programme Committee, IWES'06-The 6th International Workshop on Emergent Synthesis (in cooperation with CIRP Workshop on Engineering as Collaborative Negotiation), **Kashiwa, Japan**.

- 18-20/9/2006: International Scientific Committee, 3rd International CIRP Seminar on Digital Enterprise Technology, **Setúbal, Portugal.**
- 9-11/10/2006: Scientific Committee, TRIZ Future Conference 2006 on Creativity, Quality and Efficiency Building an Innovation Culture, **Kortrijk, Belgium.**
- 8-11/3/2007: Program Committee, GRAPP 2007, 2nd International Conference on Computer Graphics Theory and Applications, **Barcelona, Spain.**
- 13-15/3/2007: Scientific Committee of the first International Conference on Smart Machining Systems, SMS '07, National Institute of Standards and Technology (NIST), **Gaithersburg, MD, USA.**
- 20-23/3/2007: Program Committee, International Conference on Systems Engineering and Modeling - ICSEM'07, Herzeliya and Haifa, Israel.
- 26-28/3/2007: International Program Committee, 2007 CIRP Design Seminar on The Future of Product Development, **Berlin, Germany.**
- 11-13/6/2007: International Scientific Committee, 14th CIRP International Conference on Life Cycle Engineering, Advances in Life Cycle Engineering for Sustainable Manufacturing Businesses, Waseda University, **Tokyo, Japan.**
- 26-29/6/2007: Program Committee of the 20th International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE-2007), **Kyoto, Japan.**
- 27-28/6/2007: International Scientific Committee, 3rd International VIDA (Virtual Design and Automation) Conference, Poznan University of Technology, **Poznan, Poland.**
- 11-13/7/2007: Program Committee, 4th International Conference on Product Lifecycle Management (PLM07), **Milano, Italy.**
- 26-29/8/2007: International Programme Committee, 6th International Conference on e-Engineering & Digital Enterprise Technology, **Harbin, P. R. China.**
- 19-21/9/2007: International Scientific Committee, 4th International CIRP-sponsored Conference on Digital Enterprise Technology (DET2007), **Bath, UK.**
- 6-8/11/2007: Scientific Committee, TRIZ Future Conference 2007, **Frankfurt, Germany.**
- 17-19/3/2008: International Scientific Committee, 15th CIRP LCE Conference, **Sydney, Australia.**
- 7-9/4/2008: International Scientific Committee, 2008 CIRP Design Conference on 'Design Synthesis', **Twente, Holland.**
- 26-28/5/2008: International Programme Committee, 41st CIRP Conference on 'Manufacturing Systems', **Tokyo, Japan.**
- 6-18/6/2008: Programme Committee, The 21st International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2008), **Poland.**
- 23-25/7/2008: International Programme Committee, 6th CIRP International Conference 'Intelligent Computation in Manufacturing Engineering', **Naples, Italy.**
- 25-27/3/2009: International Program Advisory Committee, 5th Conference on Axiomatic Design (ICAD 2009), **Lisbon, Portugal.**

- 30-31/3/2009: International Scientific Committee, CIRP Design Conference on Competitive Design, **Cranfield, UK.**
- 24-27/6/2009: 22nd International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE-2009), **Tainan, Taiwan.**
- 2009: International Programme Committee member, 5th IWC TQM, **Belgrade, Serbia.**
- 2009: International Scientific Committee, 42nd CIRP Conference on Manufacturing Systems, **Grenoble, France.**
- 26-28/5/2010: International Scientific Programme Committee, 43rd International Conference on Manufacturing Systems “Sustainable Production and Logistics in Global Networks”, **Vienna, Austria.**