

ADAM COHEN

OVERALL ACHIEVEMENT SUMMARY

- Highly innovative senior manager and engineer with over 26 years of technology and senior management experience spanning medical devices, mechanical engineering, advanced manufacturing technology, capital equipment, and business development and marketing of breakthrough products
- Founded Microfabrica Inc. to bring to market a breakthrough technology for manufacturing highly-miniaturized devices with unprecedented complexity; as the company's CEO, raised \$17M in equity funding
- Led Microfabrica's successful entry into the medical device business, landing major customers and a \$5.1M NIH grant to develop robotically-manipulated devices for minimally-invasive cardiac surgery, and helping to land an equity investment by top-tier medical device VCs Versant Ventures and InterWest Partners
- Pioneer of the 3-D printing (a.k.a. additive manufacturing, rapid prototyping) industry
- Inventor on over 50 issued U.S. patents, with dozens pending
- Co-founded, and served as Vice President of AMEX-traded Soligen Technologies, ranked in 2000 as one of Los Angeles' 50 fastest-growing tech companies; shipped complex 3-D printing equipment just seven months after starting development
- At product line/program manager at 3D Systems, led the team that developed the first workhorse of the 3-D printing industry and the company's first successful product, generating over \$100M in revenue
- At Microfabrica and USC, brought in \$10M in contracts and grants from NIH, DARPA, and NSF
- Professor of mechanical engineering at SMU
- Founded a 3-D printing consulting/publishing firm, publishing the first industry periodical and directory

SKILLS AND EXPERIENCE SUMMARY

- Senior management of startup high-tech companies, including engineering, R&D, business development, marketing, and IP
- Medical devices—design of multiple devices (e.g., balloon catheters, biopsy forceps, PFO closure implant, cataract surgery instrument), business development, market and competitive analysis, clinician interface
- Product line and program management of all engineering functions (mechanical, electrical, optical, software, process/materials) in the development and commercialization of sophisticated, high tech capital equipment and processes
- Systems engineering and problem solving
- Experienced or familiar with most traditional and nontraditional manufacturing processes
- Proficient with SolidWorks, Visio, Microsoft Project, and Microsoft Office

EXPERIENCE

Clinical Associate Professor, January 2013-present
Visiting Clinical Research Assistant Professor, October 2011-December 2012
Department of Mechanical Engineering, Lyle School of Engineering, SMU, Dallas, Texas

SMU is a private university with campuses in Texas and New Mexico.

- Pursuing research funding related to 3-D printing, robotics, and medical devices
- Teaching courses in mechanical engineering and design, including CAD, robotics, and prototyping

- Developed *Rapid Product Realization*, a new hands-on prototyping and manufacturing course

Founder and CEO, November 2010-present
innoNovo LLC, Dallas, Texas

innoNovo is an engineering and new product development consultancy with special expertise in advanced manufacturing technologies such as 3-D printing and microfabrication; mechanical engineering; medical devices; and product design and development.

- Consulting for small and large companies including Covidien (the latter in the development of an advanced, next-generation balloon catheter)
- Edison Awards 2013 Judge

Executive Vice President, Technology and CTO, August 2002-October 2010
Founder, President, and CEO, August 1999-August 2002
Microfabrica Inc., Van Nuys, California

Microfabrica is a venture-backed (>\$62M) technology company specializing in MICA Freeform (a.k.a. EFAB[®]), a proprietary 3-D printing technology enabling mass production of complex 3-D metal devices—including fully-assembled mechanisms—at the micro and millimeter scale. The ISO 13485:2003-certified company's main activities are development of minimally-invasive surgical instrumentation and volume production of micro-probes for semiconductor testing.

- Founded Microfabrica and spun it out of the University of Southern California
- Negotiated exclusive worldwide technology license and \$1.2 million DARPA subcontract
- Raised \$11.3M from DFJ, DynaFund, Chevron, and others at a high valuation; in the post-9/11 environment, raised \$6M more with Partech as the lead investor at increased valuation
- Inventor on most of Microfabrica's patents; granted ~45 U.S. patents with dozens more pending
- Beginning in '06 as de facto VP of medical business development, led a major push into medical devices which proved critical to raising funding from top-tier investors Versant and InterWest
- Initiated and managed as co-principal investigator a multi-year collaboration with Boston University and Harvard Medical School that won a \$5M NIH grant to develop new micro-devices for minimally-invasive robotic cardiac surgery; this has yielded innovative devices such as a microscale debrider to precisely/continuously remove tissue and a novel closure device
- Spearheaded medical market research/internal product definition activities including competitive analysis
- Landed and managed Microfabrica's first medical contract (a miniature biopsy device for a major device company); initiated a contract with a major pharma company for drug delivery microneedles
- Designed, simulated, and prototyped many new concept medical devices to stimulate interest, including devices for tissue removal and approximation
- Managed materials biocompatibility evaluation and program to develop an implantable material
- Interviewed dozens of physicians in a wide range of clinical specialties (e.g., interventional cardiology, neurosurgery/interventional neuroradiology, ophthalmic surgery, microsurgery, urology, drug delivery, endodontics), shadowed doctors in the OR, and attended medical conferences to identify unmet clinical needs and brainstorm new solutions
- Quickly became conversant with a wide range of medical procedures, companies, and devices
- Started to assemble a medical advisory board
- Made dozens of presentations at medical device companies: from startups to industry leaders
- Supervised Microfabrica's intellectual property/legal vice president

- Grew company to ~25 employees (currently many more)
- Led the company to commercialize EFAB, developing two generations of sophisticated automated capital equipment and solving major process problems
- Managed the team that transitioned and scaled up the EFAB process to a production-ready platform
- Invented a novel electrochemical extrusion process and won ~\$1M in NSF Phase I and II SBIR grants
- Created a service to provide access to the company's process at reduced cost, managing the development of new software for customer use
- Authored/co-authored multiple conference papers, magazine articles, a book chapter on MEMS, and a major white paper on EFAB for medical devices, led marketing communications activities

Project Leader, April 1996-April 2000
USC/Information Sciences Institute, Marina del Rey, California

ISI is a world-renowned research institute operated by the University of Southern California focused on networking technology (it played a major role in developing the Internet), robotics, artificial intelligence, and electronics packaging, and operates the MOSIS semiconductor fabrication service.

- Invented EFAB technology, a microscale metal high-volume additive manufacturing process
- Landed \$3.6M in DARPA contracts to develop EFAB along with the world's smallest (~2 mm diameter) electrical generator with no moving parts
- Managed a team of two staff researchers and a PhD candidate to bring EFAB from idea to reality in about 18 months, while developing two generations of EFAB process equipment
- Conceptualized, specified, and managed the development of enabling software allowing photomasks to be generated from 3-D CAD data
- Presented widely on EFAB, including invited presentations at major corporations, research institutes, conferences, and workshops (e.g., NIST, DARPA); invited to write a chapter for *The MEMS Handbook*
- Prior to the development of EFAB, worked with a prizewinning roboticist to develop an "intelligent motion surface" micro-robotic device for micro-manipulation and assembly

Co-founder, Vice President R&D, de facto VP Marketing, October 1991-March 1996
Soligen Technologies, Inc., Northridge, California

Soligen was the first company to commercialize an advanced 3-D printing technology invented at MIT. The company developed equipment and operated a contract manufacturing service which allowed functional parts to be fabricated in days by casting metal into ceramic molds produced automatically from CAD data. Soligen went public and traded on the American Stock Exchange.

- Negotiated worldwide exclusive field-of-use license with MIT
- Co-developed the business plan, performed market research, and developed a marketing plan
- Transferred technology from MIT's lab and wrote product hardware and software specifications for a sophisticated, automated manufacturing system
- Co-designed 1st and 2nd-gen systems, performed system engineering and subsystem development
- Managed the program to bring the first system from concept to market in just seven months
- Created and managed the R&D department, developing and optimizing processes and materials
- Established the IP department; managed through a successful resolution a major patent lawsuit
- Led the project to source a vendor of critically-needed inkjet printhead technology; negotiated a business relationship and managed the technology transfer

- Won a DARPA subcontract, then spec'd, designed, and managed the implementation of one of the earliest Web based e-commerce systems
- Managed trade shows, developed marketing materials, and handled public relations

Founder and President, February 1991-October 1992
F Cubed, Los Angeles, California

F Cubed was a consulting and publishing firm specializing in 3-D printing.

- Founded the company and launched and edited the first industry periodical (Rapid Prototyping Report) on 3-D printing technologies and applications, and the first 3-D printing industry directory
- Responsible for marketing, research, writing, publishing, and administration
- Built up circulation and sold the newsletter and directory to an established publisher, remaining editor for an additional year
- Established reputation as a 3-D printing authority, consulting/lecturing at UCLA and for major corporations

Product Line/Program Manager, November 1988-February 1991

Project Engineer, March 1988-October 1988

Process Development Engineer, September 1987-February 1988

3D Systems, Inc., Valencia, California

3D Systems is the pioneer and a leader of the 3-D printing industry. The company produces equipment for stereolithography and other 3-D printing processes used in the rapid manufacturing of models and prototypes.

- Managed the development, from concept to production, of complex automated capital equipment based on stereolithography, a breakthrough technology that created an entirely new industry
- Led the team that developed the SLA-250, the company's primary product for years and the first workhorse of the 3-D printing industry with an installed base of ~ 600 units and sales exceeding \$100M
- Assembled a five-person program management department supervising the efforts of some 40 professionals in mechanical, electrical, software, process, materials, and optical engineering
- Exercised primary responsibility for engineering support of 3D Systems primary product line
- Served as primary engineering liaison with marketing, production, purchasing, quality, field service
- Developed requirements and specifications, provided conceptual design and systems engineering, and managed development projects for complex systems, software releases, and field retrofits
- Soon after starting, was given responsibility for the training, support, and field service of three major corporate Beta customers (Baxter, United Technologies, and Kodak).
- Served briefly as Electrical Engineering Manager
- Invented a new approach to stereolithography using thin films, and new 3-D software algorithms

Engineer-Mechanical Product Engineering, August 1986-August 1987

Dataproducts Corporation, Woodland Hills, California

Dataproducts (later acquired by Hitachi) was a major domestic manufacturer of computer printers.

- Quickly became the in-house authority on xerographic technology and laser printer physics
- Diagnosed customer problems and designed and tested mechanical solutions for field deployment
- Designed and implemented custom apparatus for print quality testing

Software Engineer/Technical Supervisor, August 1980-June 1982
Parmly Hearing Institute, Chicago, Illinois

The Parmly Hearing Institute is a medical research institute operated by Loyola University of Chicago.

- Developed machine language, Fortran, and Basic software to automate clinical experiments
- Discovered the “anti-pinhole” imaging phenomenon: published results in international optics journal and received a write-up in Scientific American
- Managed the Technical Department and supervised assistants

EDUCATION

Art Center College of Design, Pasadena, CA

- Coursework in industrial design, 2011

Stanford Center for Professional Development

- The Cardiovascular System in Health & Disease: Fundamental Concepts for the Medical Device Industry, 2006

King’s College, London, England

- Graduate coursework in mathematical physics, 1985-1986
- Filed several pioneering patent applications relating to digital sound for motion pictures

Massachusetts Institute of Technology, Cambridge, MA

- Bachelor of Science in physics, 1985
- Additional coursework in electrical engineering, optical engineering, and entrepreneurship
- Academic distinctions include an Eloranta Fellowship, a Mili Foundation grant, a Sigma Xi grant, an award (the highest ever) from the MIT Council for the Arts, and election to Sigma Pi Sigma
- Received support from Polaroid founder Edwin Land, strobe photography inventor Harold Edgerton, father of information theory Claude Shannon, and others to produce a documentary on the history of robotics
- Authored a thesis on fluid mechanical phenomena, which included *Fluidmagic*, a highly popular lecture-demonstration and educational video

School of the Art Institute of Chicago, Chicago, IL

- Undergraduate coursework in media technology, 1979-1980
- Studied holography, video and audio signal processing, computer graphics programming, etc.

PATENTS AND PUBLICATIONS

- Over 50 issued U.S. patents in the fields of 3-D printing and MEMS, with dozens pending for processes, materials and medical devices; first or sole inventor on most of these
- Cohen, “High-Volume Additive Manufacturing of Highly-Miniaturized Metal Devices”, IMAPS Advanced Technology Workshop on 3D and Conformable Printed Electronics, El Paso, TX, February 22, 2012.
- Gosline et al., “Percutaneous Intracardiac Beating-heart Surgery using Metal MEMS Tissue Approximation Tools”, International Journal of Robotics Research 31(9), pp. 1081-1093 (2012).
- Butler et al., “Metal MEMS Tools for Beating-heart Tissue Approximation”, 2011 IEEE International Conference on Robotics and Automation (ICRA), May 9-13, 2011, Shanghai, China. Selected as one of the five finalists for the Best Medical Paper Award.

- Vasilyev et al., “Image-Guided Beating-Heart Closure of Patent Foramen Ovale Using Novel MEMS Closure Device”, TCT (Transcatheter Cardiovascular Therapeutics) 2010, Sept. 21-25, Washington
- Cohen et al., “Volume Manufacturing of Functional 3-D Metal Micro-Mechanisms”, ICOMM/4M 2010, Madison, Apr. 5-8, 2010
- Cohen et al., “Fabricating a Micro-Scale, Multi-Component Instrument for Minimally-Invasive Surgery”, Commercial Micro Manufacturing, Volume 3, Issue 1, pp. 52-56
- Cohen et al., “Microscale metal additive manufacturing of multi-component medical devices”, Rapid Prototyping Journal, 16(3) (2010)
- Cohen et al., “Wafer-Scale, Solid Freeform Fabrication of Fully-Assembled Metal Micro-Mechanisms for Minimally-Invasive Medical Devices”, *Solid Freeform Fabrication Symposium 2009, Proceedings*, UT Austin; awarded a “SFF Symposium Outstanding Paper” distinction
- Chen et al., “Microfabricated tissue removal instruments for minimally-invasive procedures”, 19th International Conference of the Society for Medical Innovation and Technology, Japan, Nov. 2007
- Cohen et al., “Batch Fabrication of Complex, Pre-Assembled, Miniature Medical Devices”, *Proceedings of ASM Materials and Processes for Medical Devices*, Palm Desert, Sept. 23-25, 2007
- Kruglick, Cohen, and Bang, “EFAB Technology and Applications”, *The MEMS Handbook*, Second Edition, CRC Press, Taylor & Francis Group, 2006
- Cohen and Wooden, “Monolithic 3-D Microfabrication of Mechanisms With Multiple Independently-Moving Parts”, *Proceedings of IMECE2005:2005 ASME International Mechanical Engineering Congress and Exposition*, Nov. 2005, Orlando
- Brown et al., “Characteristics of Microfabricated Rectangular Coax in the Ka Band”, Microwave and Optical Technology Letters, Vol. 40, No. 5, March 5, 2004.
- *The MEMS Handbook*, CRC Press, 2000 (co-author)
- Cohen, “3-D Micromachining by Electrochemical Fabrication”, Micromachine Devices, Mar. 1999
- Cohen et al., “EFAB: Low-Cost, Automated Electrochemical Batch Fabrication of Arbitrary 3-D Microstructures”, Micromachining and Microfabrication Process Technology session of SPIE’s 1999 Symposium on Micromachining and Microfabrication
- Cohen et al., “EFAB: Rapid, Low-Cost Desktop Micromachining of High Aspect Ratio True 3-D MEMS”, *12th IEEE International Microelectromechanical Systems Conference, 1999, Technical Digest*, IEEE
- Cohen et al., “EFAB: Batch Production of Functional, Fully-Dense Metal parts with Micron-Scale Features”, *Solid Freeform Fabrication Symposium 1998, Proceedings*, UT Austin
- Rapid Prototyping Report--The Newsletter of the Desktop Manufacturing Industry, (June 1991-October 1992), and The Rapid Prototyping Directory, CAD/CAM Publishing, Inc.
- *Rapid Prototyping and Manufacturing*, Society of Manufacturing Engineers, 1992 (co-author)
- Cohen, “Anti-Pinhole Imaging”, Optical Acta, vol. 29, no. 1 (1982)

PROFESSIONAL MEMBERSHIPS

- American Society of Mechanical Engineers
- IEEE, including the Robotics and Automation Society
- International Microelectronics and Packaging Society