MATT RICHTER, PH.D.

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INDUSTRIAL PHYSICIST

Driven and perceptive high-technology leader with sixteen years' progressive experience using innovative methodologies to increase product values while decreasing costs. Constantly applies best of breed mentality to identify relevant issues, develop precise workflows, and design successful solutions. Possesses rare combination of technical expertise, business acumen, and affability, resulting in leadership that engages staff, clients, and stakeholders. Experienced at generating impacts in multiple industries, and engaging with organizations across all levels of business development. Accurate, astute, and articulate.

Corporate Competencies

- ✓ Organizational Strategy & Revenue Growth
- ✓ Concept Design, Development & Assembly
- ✓ Rapid Vision-to-Market Implementation
- ✓ Cost Reduction Opportunities Identification
- ✓ System Analysis for Increased Efficiency, Innovation Integration & Value Growth
- ✓ Team Building & Management
- ✓ Internal & External Problem Resolution
- ✓ Client Relations & Sales Expansion
- ✓ Technical Editing, Media & Communications

TECHNICAL EXPERTISE

MODELING & PROTOTYPING: 3D Modeling using SolidWorks, Rapid and Virtual Prototyping, Cost of Operation and Overall Equipment Effectiveness Modeling
MANUFACTURING: Design for Manufacturability, CNC Manufacturing
APPLICATIONS: Design, Development, Refinement
DESIGN: Electro-Mechanical, Piezoelectric and Optical Instrumentation
THIN-FILM: Optical Thin-Film Metrology (Both IR and UV/VIS/NIR; in-situ, in-line and stand-alone), Thin-Film Measurement and Characterization from UV to IR
MICROSCOPY: Emission Microscopy based Failure Analysis of Semiconductor Devices, Atomic Force Microscopy
SPECTROSCOPY: Gas-phase IR Absorption Spectroscopy for Process Characterization, Development and Control; Electron Spectroscopy (Auger, Photoelectron and X-ray Absorption)
LITHOGRAPHY: Process Development, Measurement and Control (specifically for Deep Ultra-Violet)
PLASMA: Diagnostics with emphasis on Etch Process Development and Endpoint Control
PROCESS CONTROL: Advanced Process Control (Run 2 Run Control and Fault Detection and Classification) for Increased Yield and Tool Productivity, PVD Process Control Using Atomic Absorption Techniques
SYSTEM: System Integration, Control and Fault Detection, Multi-Variant Analysis for Process Optimization

PROFESSIONAL EXPERIENCE

FES, LLC • CA — 2007 – 2014

CO-FOUNDER AND MANAGING MEMBER

FES, LLC leveraged the increasing capabilities of low-cost microcontrollers to supply innovative solutions to the MINI Cooper marketplace. Also hired to design products for air quality measurement and optical spectroscopy for liquids using micro-fluidics.

- Designed and launched organization with initial product (The TrackCoach® ProShift shift-light) that provided 80% of function of $2k race computer in $150.00 package. Minimized costs via virtual prototyping, 3D printing, and design for manufacturability.
- Reduced program costs by co-developing assembly and test fixtures during product design. Resulted in product comprised of only 5 parts (PCB, Reflector, Diffusor, Tubular Housing and Cable) with no conventional fasteners.
- Achieved US Patent #7,859,394.

FES, LLC – Cont.-

- Diversified organization to include consulting services to mitigate 2008 recession.
- Managed design and manufacturing of compact air sampling system (HomeAirCheck.com) that enabled client to lower cost of airborne contaminant detection by 98% (from $5k to $100.00).
- Minimized manufacturing costs by employing small scale CNC tooling with all fixtures, CNC programming, and in-house manufacturing.
- Demonstrated proof-of-concept system that would reduce analytic chemical consumption from hundreds of dollars per month to less than $10.00 per year due to reduced sample sizes.
- Strategized final product at cost of $300.00 per unit compared with current industrial system of $50k per unit (99.4% decrease). Overall cost of ownership estimated at less than 1% of current industrial solution.

MKS INSTRUMENTS & ONLINE TECHOLOGIES • CT & CA 1998 – 2006

TOOLWEB MARKETING MANAGER (2006)

NORTH AMERICAN T3 MANAGER (2005)

DIRECTOR OF WEST COAST OPERATIONS, ON-LINE PRODUCTS GROUP (1998-2004)

MKSI is a global provider of instruments, subsystems, and process control solutions that increase process performance in advanced manufacturing. OT fabricates products based on Infrared spectroscopies.

- Progressed from leading West Coast operations as sole territory staff member, to leading North American Applications Team to bring product solutions rapidly to market; then advanced to directing product and applications development as key personnel member involved in strategic account identification and capture.
- Grew West Coast sales by 100% yearly across three-year tenure at location. Developed several volume OEM customers now compromising 35% of On-Line Product Group revenues.
- Co-authored seven patents in the area of data transport and MVA for process control.
- Won $100k Phase I NSF SBIR grant for investigation of FTIR-based thin-film metrology as applied to deep ultra-violet photo-lithography.
- Guided team to create new products leveraging advanced networking, emerging data manipulation, and low-cost computing technologies.
- Developed team workflow to rapidly progress from opportunity identification, to solution demonstration, to revenue capture.
- Handled all operations, corporate management, strategic account management, budgeting, customer support and service to process development, product design, and marketing for West Coast territory.
- Managed three products: revolutionary endpoint detector (Process Sense) used to control remote-plasma applications; SECSTrace, a software product used to collect semiconductor manufacturing equipment data; and Epi-InLine (shared responsibility), a novel integrated metrology product employing run-to-run control architecture to provide a demonstrated 20% increase in tool productivity.
- Identified emerging markets in advanced process control and fault detection markets.

SC TECHNOLOGY, INC. • CA 1996 – 1998

SENIOR APPLICATIONS ENGINEER

SC Technology manufactors UV/VIS/NIR optical sensors for the semiconductor industry. The key applications are plasma diagnostics and endpoint control, and UV/VIS/NIR spectral reflectometry for thin film characterization and process diagnostics.

- Designed combined Halogen-Deuterium light source and several application specific in-situ optical probes for plasma diagnostics and film characterization. Also devised N/A matched optics using Zemax optical design package.
- Identified new application areas (in-situ testing and qualifications for lithography tracks & multi-wavelength algorithms for etch endpoint control) with potential to increase sales by 50%.
- Provided guidance and advice to the manufacturing team for testing procedures and troubleshooting of SC product line.
- Delivered application support to customer base.

INTELLIGENT SENSOR TECHNOLOGY • CA 1995 – 1996

PRODUCT MANAGER

IST manufactures a PVD process controller using a proprietary UV/VIS/NIR atomic absorption technology. The unit employs a patented dual lightsource/fiberoptic design in order to eliminate system drift.

- Co-developed improved hollow cathode light source (pulsed, electron boosted discharge design) and supporting electronics leading to demonstrated 3.5x improvement in system S/N.
- Modeled entire optical path to determine sources of optical loss.
- Oversaw manufacture of seventeen Atomicas atomic absorption based PVD deposition controllers, an increase of 80% over previous year's total.
- Provided training, service, after sales, and applications support.

HYPERVISION INC. • CA 1994 – 1995

SR. APPLICATIONS ENGINEER, MEMBER OF TECHNICAL STAFF

Hypervision is the market leader in advanced emission microscope technology for failure analysis of active devices. The emission microscope uses advanced night vision technology (GEN III) combined with computer controlled probe stations (Karl-Suss, Micromanipulator, Cascade-Alessi and Wentworth probe stations were supported).

- Co-developed dual-camera design sold as HRIO option on Visionary brand Emission Microscopes. The addition of high-resolution machine vision camera increased system resolution 3x.
- Provided worldwide installation, training, and service across three continents.

BURLEIGH INSTRUMENTS, INC. • NY 1993 – 1994

SPM SCIENTIST

Burleigh Instruments manufactures a variety of products based on peizo-electric technology: Scanning Probe Microscopy, wavelength measurement, and positioning.

- Established and ran SPM applications lab. Handled evaluation of customer samples, including detailed technical evaluation with AFM images. Increased lab productivity and sample evaluation quality.
- Developed prototype UHV STM with XY sample positioning, in-situ sample heating, and in-situ tip exchange.

TECHNICAL COMMUNICATIONS EXPERIENCE

WESTERN AUTOMOTIVE JOURNALISTS 2011 – 2013

MEDIA CHAIR

MC SQUARED MAGAZINE 2006 – 2011

TECHNICAL EDITOR

Other PROFESSIONAL EXPERIENCE

STANFORD SYNCHROTRON RADIATION LAB. 1986 – 1993

RESEARCH ASSISTANT, LINDAU/PIANETTA RESEARCH GROUP

- Ran or participated in several experiments investigating surface properties of semiconductors (Si, Ge, GaAs, InP) using synchrotron radiation. Resulted in publication of twelve refereed articles.
- Modified and operated UHV surface EXAFS and electron spectroscopy system to add STM capabilities. Items designed and built include: vacuum chambers, pumping systems, sample preparation and transfer systems, and manipulator heads.
- Built and operated DEC microVAX based STM system. Items designed and built include: STM heads, SPM control electronics (spectroscopic and electrochemical capabilities), and vibration isolation systems.

STANFORD DEPARTMENT OF APPLIED PHYSICS 1985 – 1986

RESEARCH ASSISTANT, QUATE RESEARCH GROUP

- Designed and constructed STM-related items, including: tip etching station, piezoelectric walker, and low-bias current pre-amplifiers.

MAXWELL LABRATORIES 1985

PROJECT ENGINEER/SUPERVISOR

- Built, characterized, and operated visible light source based on electrostatic discharge and plasma switch technology.

EDUCATION

- **PH.D. APPLIED PHYSICS**, STANFORD UNIVERSITY (PALO ALTO, CA)**:** 1993

  DISSERTATION: The Si(100)-Sb 2x1 and Ge(100)-Sb 2x1 Surfaces: A Multi-Technique Study
- **B.A. PHYSICS**, UNIVERSITY OF CALIFORNIA, SAN DIEGO (LA JOLLA, CA): 1985

SELECTED PATENTS

- Media US Patent #7,630,786: "Manufacturing Process End Point Detection." Covers use of MVA to determine virtual process endpoint. While mostly applied to improved process control in semiconductor processing, the method is universal and capable of detecting process endpoint for which there is no direct sensor signal.
- US Patent #7,787,477: "Address Transparent Device and Method." Covers techniques and device for improved data transport in an existing semiconductor manufacturing environment. The product based on this patent, the MKS Instruments TOOLweb® Sensor Integration Platform, was adopted by Intel to increase yield and performance of microprocessor manufacturing by allowing for the transport and use of relevant data existing manufacturing execution systems, enabling more Advanced Equipment Control and Advanced Process Control (AEC/APC). It received an Editors' Choice Best Product Award presented by Semiconductor International magazine at Semicon West, 2006.
- US Patent #7,859,394: "Shift Light Method and Patent." Covers the novel technology and embodiment of the FES LLC ProShift shift light. This product brought the capabilities previously only available to professional race teams to the enthusiast driver.

SELECTED PUBLICATIONS

Authored and co-authored over 20 refereed publications.

- Richter, M., J. C. Woicik, J. Nogami, P. Pianetta, P., K. E. Miyano, A.A. Baski, T. Kendelewicz, C.E. Bouldin, W.E. Spicer, C.F. Quate, and I. Lindau, I., "Surface Extended-X-Ray-Absorption Fine Structure and Acanning Tunneling Microscopy of SI(001)2X1-SB," *Physical Review Letters* 65, Iss.27 (Dec 1990): 3417-3420.
- Richter, M., M. L. Spartz, P. R. Solomon and P. A. Rosenthal, "The IR Fingerprint: Using IR Absorption Spectrometery to Monitor Gases for Process Control," *SENSORS, the Journal of Applied Sensing Technology* 16, no. 5 (May 1999).
- Richter, Matt, Ph.D. "Suspension Basics – Keeping the Rubber on the Road," *MC2 Magazine* (Nov-Dec 2006): 68-71.
- Richter, Matt. "WiFi Health and Safety: A Summary of the Mess!" *Dr. Obnxs' Musings Blog*, January 23, 2015. http://www.drobnxs.com/2015/01/23/wifi-health-and-safety-a-summary-of-the-mess/.

PROFESSIONAL ASSOCIATIONS

- Member, IEEE (1997-present)
- Lifetime Member, American Physical Society
  - *Founding Member*, Forum on Industrial and Applied Physics: FIAP (1995)