Jim Lagrant

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Curriculum Vitae

PROFILE

Senior manufacturing engineer with 20 years' experience in process development, scale-up, data collection and analytics.

- Adept at identifying and implementing automation improvements on traditionally manual processes.
- Passionate champion for time-series and transactional process data collection and analytics.
- Intellectually curious about manufacturing process development, efficiency improvements and new technology.

EDUCATION

Worcester Polytechnic Institute, Worcester, MA
Master of Science, Manufacturing Engineering, 1998
Thesis: "Process Automation and In-Situ Cutting of Glass Fibers"

Bachelor of Science (High Distinction),Manufacturing Engineering, 1995

EXPERIENCE

University of Massachusetts, Amherst, MA — *Professor of Practice in Manufacturing 2019-Present*

Filling a newly created position in the Mechanical and Industrial Engineering department within the College of Engineering at the state's flagship campus. I am developing and teaching basic and advanced manufacturing-related courses including: design of components, design of systems (senior capstone design), manufacturing processes, statistical quality control, and industrial automation. I am also maintaining my industry network for case studies and practical experience opportunities and serve as the department's main contact for industry-focused capstone experiential activities and will be serving as the director of the MS in Manufacturing and the 4+1 Manufacturing programs. The focus of my curriculum development is to provide engineering students with hands-on education using commercially available hardware and software which will enable manufacturing to transition from industry 3.0 to industry 4.0.

Palmer Foundry, Palmer, MA — *Vice President of Engineering 2015-Present*

Reduced labor and material costs by initiating CNC machining discovery project. Secured and administered $250k state workforce training grant that allowed implementation of business performance system focusing on employee-driven safety programs, cost-reduction projects, continuous employee skills development and 5S. Decreased product turnover time by designing semi-automated fixtures to replace manual process. Researched and identified alternative metal holding process using 75% less energy than existing equipment, then obtained energy initiative funding to subsidize capital installation and equipment costs. Installation of this system was the first of its kind in North America. Identified process improvement opportunities, designed and installed equipment upgrades on legacy equipment and historically manual processes. Continued expanding enterprise manufacturing intelligence system to encompass business health metrics in addition to raw material, process and product metrics. Mentored four to six shop floor employees, high school and college co-op students annually.

General Manager 2012-2015

Set tone of organization focusing on collaboration, teamwork, innovation and shared success. Maintained duties of Director of Engineering, as well as supervising 60 direct and indirect reports from operations, quality assurance and maintenance teams. Identified internal and external threats to business from an operations perspective. Recommended strengthening employee training program to meet needs of incoming workforce. Planned and facilitated annual corporate planning meetings.

Director of Engineering 2010-2012

Developed and led continuous improvement strategies for processes, equipment and facilities. Played major role in Palmer Foundry's reputation as a company that could prove process stability and capability. Managed four-person maintenance department. Implemented computerized maintenance management system. Key member of steering and implementation team for company's registration to ISO 9001-2008 standard. Designed and installed plant process network and supervisory controllers to automate previously detached processes. Installed enterprise management information system to track raw material, process and product quality parameters throughout the business. Installed process data historian to monitor and troubleshoot process equipment. Trained management team on statistical process control. Mentored a shop floor employee on controls systems design and programming who eventually was promoted to engineering technician. Gained industry-wide recognition for the Foundry's data collection and analytics systems leading to publication in trade magazines and nation-wide speaking engagements

Quabbin Wire and Cable Co., Inc., Ware, MA *Process Engineer 2008-2010*

Spearheaded plant-wide scrap reduction project that included database design and report generation. Reduced overall scrap by 10%, convincing company of the power of process metric tracking. Introduced new process instrumentation into a traditional manufacturing environment. Designed mechanical and electrical improvements to existing equipment. Served as project manager for installation of new process equipment, ensuring schedule was met and appropriate materials and manpower were in place. Led process development projects to re-establish capability for existing products. Supported product design engineer and operations team to introduce new products to the market. Introduced standardized project practices and new product qualification procedures.

The Dennis Group, LLC., Springfield, MA Controls and Instrumentation Engineer *2006 –2008*

Planning, design, engineering and construction management firm for the food and beverage industry. Responsible for control system hardware specification, design, and installation on jobs ranging from single process upgrades to entire processing plants. Provided on-site electrical support and commissioning of devices, plant process lines and utility systems. Gave direction to electrical contractors during panel installation and field wiring. Performed duties as process, controls and electrical engineer for the installation of six new processing lines on succeeding projects. Specified and procured processing and packaging equipment. Designed process electrical distribution and control panels. Responsible for equipment, electrical and software bids. Collaborated with construction manager, client and contractors to ensure rigging, piping and electrical and software packages were installed according to specifications and timeline.

W.L. Gore & Associates, Inc., Elkton, MD *Automation Engineer 2003 – 2006*

Responsible for the design of new processes, human machine interfaces (HMIs) development, control system programming, data collection, logging and reporting. Managed numerous upgrade projects on multi-million dollar batching system, coating lines and fiber processes, each with separate control systems. Designed, installed, and commissioned state-of-the-art, eight-station durability test equipment for new product development. Upgraded legacy HMIs on three process lines. Added recipe control capability, which reduced setup time by more than 50% and provided management of change control and revision tracking to product recipes. Served as controls liaison for new liquid and powder batching system. Worked with team to develop functional specification of new equipment. Ensured machine met the company's electrical standards. Helped coordinate installation and commissioning of equipment to ensure functional specifications were attained. Provided ongoing support on equipment after installation. Integrated down time analyst software on three process lines to capture overall equipment effectiveness (OEE) through automatic data collection and operator input. Championed sustain phase of manufacturing execution system (MES) project for fuel cell group. Developed and integrated automatic statistical process control (SPC) reports for four processes. Earned additional responsibility of controls support engineer for all process lines within the business unit.

Process Engineer 1998 – 2003

Responsible for obtaining and sustaining stable and capable processes that and safely and economically produced fuel cell membrane electrode assemblies (MEAs). Responsible for both manual assembly cell and high-volume conversion and lamination process. Implemented improvements in die cutting efficiency through die redesign that eliminated a material and labor-intensive lay-up process. These improvements increased throughput by 400% and reduced positional variation by 200%. Responsible for design of steel rule dies, documentation, and revision control. Utilized geometric dimensioning and tolerance (GD&T) standards to ensure customers' needs were translated to internal production. Participated as a key member of small

team that developed and commissioned a high-volume production line: created functional specification for a lamination and die-cutting process; competitively bid project to numerous equipment integrators; worked with chosen integrator to finalize design and build equipment; performed factory and customer acceptance testing. Performed new product development using design of experiment approach (DOE) to reduce development time and lead SPC efforts to improve process capability (cPk). Responsible for all controls enhancements and troubleshooting.

SELECTED SPEAKING ENGAGEMENTS

Lagrant, Jim. **Process and Data Automation for the Mid-Sized Foundry.**
(2019, April) *The Manufacturing Leadership Forum*, Houston, TX.
(2019, February) *American Foundry Society WI Regional Exposition and Conference*, Milwaukee, WI.
(2018, November) *Aluminum Casting Conference*, Knoxville, TN.

Lagrant, Jim. **Uniting the Business Around Process Analysis Data.**
(2018, May) *Automation Conference and Expo*, Chicago, IL

Lagrant, Jim & Donahue, Ray. **Applications of Laser-Induced Breakdown Spectroscopy (LIBS) in Molten Metal Processing.**
(2016, September) *North American Die Casting Association Die Casting Congress and Tabletop*, Columbus, OH

Lagrant, Jim. **Can EMI make you smarter? Recasting Palmer Foundry with EMI.**
(2014, March) *ARC Advisory Group Industry Forum*, Orlando, FL

PROFESSIONAL ASSOCIATIONS

Foundry Educational Foundation
New England regional representative and board member beginning April 2019

International Journal of Metalcasting
Peer reviewer since 2017

Aluminum Association
Between 2016 and 2017, served as a member of the working group revising the 16th edition of the national standard, "Standards for Aluminum Sand and Permanent Mold Castings."

Society of Manufacturing Engineers
Member since 2010

CLASSES TAUGHT

In-Person

MIE313 Design of Components
MIE375 Manufacturing Processes
MIE395A Engineering Professionalism
MIE415 Design of Mechanical Systems
MIE497M Industry Sponsored Mechanical Design
MIE422 Statistical Quality Control
MIE5/697AU Industrial Automation

Online

MIE375 Manufacturing Processes
MIE422 Statistical Quality Control

AWARDS

2021 Faculty Research Grant. *Student-designed, adaptable smart manufacturing model process for undergraduate and graduate education.*