William T. Pate

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Dedicated, team-oriented professional with expertise in business operations, processes, and procedures. Keen eye for detail and accuracy. High degree of experience with detailed understanding of subprocesses in mineral processing unit operation to provide software tools for simulation, equipment selection, equipment sizing and optimization of mineral processing plants. Proficient in multiple programming languages including C, C++, C#, .NET, Java, Visual Basic, and VBA.

Authorized to work in the US for any employer

PROFESSIONAL EXPERIENCE

Chief Scientist

Metso Minerals, York, PA
2016 to 2020

Metso Minerals, Colorado Springs, CO
2012 to 2020

- Work with Modeling Team at the interface between HFS and PBM
- Programmed process models into Metso VPS, a web-based program for selecting and sizing equipment that Metso Minerals manufactures for processing ores such as copper ore. The programming language was C#.
- Programmed Excel VBA routines for estimation of ore characterization parameters using data from lab tests, pilot plant tests and full-scale plants.
- Programmed post-processing of DEM simulations of ball mills, SAG mills, and SAG mill discharge systems.
- Provided tech support and consultation to Metso process engineers for the support of sales or for existing operations with Metso mills
- Worked with York test lab to implement test procedures developed in Colorado Springs for Metso Lab for ore characterization tests used in equipment selection and sizing
- Ensure the successful transfer of Multiphysics technology to the Metso ProSim / Plant Optimization platform
- Prepare reports of simulation data for scientists and engineers
- Liaise with product lines and other Metso business units to facilitate the application of multi-physics modeling for product development and prototyping
- Liaise with suppliers of specialized modeling and simulation software
- Plan, execute and monitor internal development projects to standardize and streamline simulation project workflows and deliveries
- Communicate with process engineers and laboratory personnel to expedite solutions of overall external and internal projects
- Use test results for selection and sizing of equipment in concentrator throughput
- Communicate with customer about test results via reports, conference calls and site visits
- Prepare and present technical publications for conferences and journal publications
- Maintain knowledge of and evaluate PBM technologies for the purpose of integration within TD and Metso product lines
- Ensure that intellectual property is managed in a secure and consistent manner
- Assist with basic CFD, DEM model building

Manager, Optimization Technology

Metso Minerals - Colorado Springs, CO
2003 to 2012

- Programmed the process models and other functionalities in Metso ProSim, a Windows desktop application for dynamic simulator for mine-to-mill simulation of base metal and precious metal ores. The programming language was C++.
- Co-developed methodology for sizing of Metso equipment in a Greenfield copper ore crushing and grinding plant
- Analyzed the results of over 70 tests conducted in a pilot plant with a HPGR-HRC 850 and VTM650 for determining optimum operating conditions and to predict performance of the plant from dozens of operating conditions.
- Worked with Lab Manger to develop test procedures for Metso Lab for ore characterization tests used in equipment selection and sizing
- Developed parameter estimation procedure from results of packed bed tests (PBT), drop weight tests (DWT) and ball mill tests (BMT).
- Managed start up team for original VPS which included design and coding
- Ensure the successful transfer of Multiphysics technology to the ProSim / Plant Optimization platform
- Prepare reports of simulation data for scientists and engineers
- Liaise with product lines and other Metso business units to facilitate the application of multi-physics modeling for product development and prototyping
- Liaise with suppliers of specialized modeling and simulation software
- Plan, execute and monitor internal development projects to standardize and streamline simulation project workflows and deliveries
- Communicate with process engineers and laboratory personnel to expedite solutions of overall external and internal projects
- Use lab and pilot plant test results for selection and sizing of equipment in concentrator throughput
- Communicate with customer about test results via reports, conference calls and site visits
- Prepare and present technical publications for conferences and journal publications
- Maintain knowledge of and evaluate PBM technologies for the purpose of integration within TD and Metso product lines
- Ensure that intellectual property is managed in a secure and consistent manner
- Assist with basic CFD, DEM model building

Manager, Optimization Technology

J.A. Herbst and Associates - Kealakekua, Hawaii
1997-2003

- Programmed MinOOcad, the predecessor of Metso ProSim. Programming language was C++ for Windows.
- Developed the interface of the PC-based real-time version of OPSA for estimating product size distribution on a conveyor belt carrying coarse ore.
- Developed a real-time soft sensor for estimating SAG mill filling and ore hardness.
- Co-developed a methodology to evaluate the grinding rates of individual minerals in a mixture being ground in a lab ball mill.
- Programmed and tested a real-time model-based control strategy for a flotation circuit in a coal washing plant.

Senior Research Engineer

Control International, Inc. - Salt Lake City, UT
1986-1996.

- Programmed model-based control strategies for SAG mills and pebble mills grinding copper and iron ores.
- Programmed a model-based control strategy for rougher flotation of copper ore.
- Programmed a model-based control strategy for a jig removing ash from coal.
- Created a program for real-time expert system control of ore grinding circuit using rules written by an engineer.

EDUCATION

PhD, Metallurgical Engineering, University of Utah, 1991," Adaptive Optimal Control of a Ball Mill Circuit", Salt Lake City, Utah

BS, Metallurgical Engineering, University of Arizona, Spring 1978, Tucson, Arizona

SKILLS

Extensive knowledge of

- Numerical analysis such as numerical integration, solution of simultaneous liner or non-linear equations, matrix algebra, optimization algorithms
- Statistics such as hypothesis test, ANOVA, Design of Experiments
- Programming languages: Assembly, Fortran, VB, VBA, C, C++, C#
- Programming XML for Microsoft Office documents using Aspose.Cells and Aspose.Words
- Programming dynamic models for real-time estimation and control, Kalman Filter for state and parameter estimation
- Advanced process control with real-time estimation of process states and parameters; expert systems for supervisory control
- Mineral processing fundamentals especially crushing, grinding, HPGRs, screening, cyclones, flotation, thickening
- Population balance models for mineral processing
- Programming mine-to-mill dynamic simulators such as Metso ProSim and VPS for
  - Equipment scale-up from lab and pilot scale tests,
  - Mixed continuous and discrete event simulation
  - Control strategy selection
- Parameter estimation from lab scale DWT, Packed Bed Test (PBT) and Ball Mill Test (BMT)
- Support of R&D projects from kick-off for lab tests and equipment sizing methodologies
- Post processing of DEM simulations (creating animations and reports)

JOURNAL PUBLICATIONS

Provided upon request.