Exponent®
Engineering & Scientific Consulting

John Buonagurio

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Professional Profile

Mr. Buonagurio specializes in geomatics and applied geodesy for earthworks and evaluation of natural hazards, computer-aided design, statistical programming and scientific software development. His geomatics modeling experience includes topographic/bathymetric modeling using lidar and sonar, GPS/GNSS positioning and error analysis, analysis of geodetic control networks, geospatial data fusion and 3D modeling.

Mr. Buonagurio has expertise in a number of engineering software packages including ArcGIS, AutoCAD, ANSYS and SolidWorks, and is a skilled software developer using the R, C++ and Fortran programming languages. His academic training in industrial engineering and petroleum engineering focuses on mathematical optimization and numerical modeling of fluid flow through porous media using CMG GEM, FLUENT and UTCHEM.

Academic Credentials & Professional Honors

B.S., Industrial Engineering, University of Pittsburgh, 2010

Professional Affiliations

Institute for Operations Research and the Management Sciences

Society of Petroleum Engineers

Project Experience

Developed a graphical user interface in C++ (Qt) and Fortran for the Probabilistic Exposure and Risk Model for FUMigants (PERFUM), a system for predicting bystander exposures to fumigants following agricultural applications.

Designed a large computational mesh to predict fluid flow through a tailings dam using FEFLOW.

Developed automated surface fitting processes in order to conduct a 'virtual survey' of concrete panel deformation on a mechanically stabilized earth wall using terrestrial laser scanning data.

Designed an excavation model for a 450 acre-foot water reservoir based on geologic reconnaissance data and contract drawings.

Developed a model of subsidence processes in South Louisiana based on an analysis of leveling networks, GPS/GNSS observations, lidar, sonar and satellite-based InSAR.

Developed a Monte Carlo simulation in SAS to predict future retiree healthcare expenses at a mining firm, using Medicare data and commercial claims databases.

Developed a Lagrangian particle tracking model using multibeam bathymetric surveys and tidal circulation data to predict spatial and temporal deposition patterns of an anti-parasitic drug at a Maine finfish farm, using MB-System, ArcGIS, DEPOMOD and custom software.

Developed a GIS plugin and data management software in C++ and C# for the spatially explicit exposure model (SEEM), an agent-based wildlife exposure model for the US Army. This model allows risk assessors to realistically evaluate terrestrial wildlife exposure to soil contaminants by incorporating species-specific foraging behaviors and habitat suitability.

Designed a 3D model in AutoCAD to estimate earthwork grading quantities at a large military facility, using construction bid documents and lidar topographic survey data.

Developed a GIS-based, site-specific share allocation model for a large Superfund site where dioxin-contaminated sediment was the primary risk driver. Analysis methods included conditional simulation and Voronoi diagrams.

For assessment of remedial options at an industrial facility, modeled infiltration of NAPL phase petroleum hydrocarbons in the vadose zone using UTCHEM.

For a litigation support case, developed a custom web-based mapping tool and web services framework in C# to query and visualize analytical chemistry data in a Gulf of Mexico embayment.

Performed a quantitative meta-analysis of cancer incidence rates in several ZIP codes attributable to chemical exposure using the EPA National Emissions Inventory, local cancer registries and US Census SF1 data.

Designed methods to correlate UK and German soil classification systems with the USDA soil taxonomy, to determine EPA acceptability of environmental fate studies of pesticides in foreign soils.