HUDDLER: a multi-language compiler for automatically generated format-specific data drivers

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The Hydrographic Universal Data Description Language (HUDDL) permits description of data organization in existing and future hydrographic data formats. HUDDLER represents an implementation of one of the many advantages of having such format descriptions: a compiler that automatically creates drivers for data access and manipulation.

The compiler is based on an XML parsing library that loads into memory the format description (frontend), and a code generator (backend) that creates code able to access the data in three different types of computer languages: procedural ANSI C, object-oriented C++, and multi-paradigm Python. The system is designed to admit other languages readily. The compiler is accessible via command line or a GUI application, named HUSH (HUDDL Schema Handler), which provides additional tools and information to the user. The compiler is here demonstrated with a variety of data formats from sonar manufacturers (e.g., Kongsberg EM Series) and acquisition software companies (e.g., HyPack) both legacy and in active development, both binary and ASCII.

Finally, a community-oriented website to access, catalogue, and disseminate hydrographic data formats resources and HUDDL-specific information has been developed and is now publicly available.

Author biographies

Brian Calder is an Associate Research Professor and Associate Director at CCOM (UNH, USA). He has a Ph.D. in Electrical and Electronic Engineering, completing his thesis on Bayesian methods in SSS processing (1997). He is currently focusing on statistically robust automated data processing approaches and tracing uncertainty in hydrographic data.

Giuseppe Masetti received a MS degree in Ocean Engineering (UNH, USA) in 2012, and a Master in Marine Geomatics (2008) and a Ph.D. degree (2013) in System Monitoring and Environmental Risk Management (University of Genoa, Italy). His postdoctoral research at CCOM/JHC is focusing on signal processing for marine target detection.