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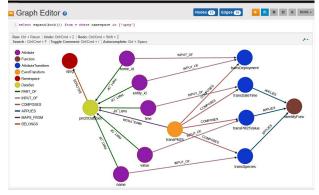
DEVELOPMENT OF A SENSOR METADATA LIBRARY FOR EXPOSOMIC STUDIES Nicole Burnett (Ramkiran Gouripeddi) Department of Biomedical Informatics

Exposomic research may utilize multiple sensors to measure individuals' environment and their physiological responses. These sensors measure physical, chemical and biological properties and have wide variations in their capabilities and performance. It is therefore important to provide sensor characterization information in order to make appropriate decisions when selecting and utilizing sensors for research studies and analysis or when performing meta-studies aggregating data from multiple sensors. I along with the Utah PRISMS Informatics Ecosystem (UPIE) developed a sensor metadata library (SML) for use in exposomic research (Grant NIH NIBIB U54EB021973).

We performed a needs assessment and utilized the sensor common metadata specifications (SCMS) developed by UPIE in designing the SML. SCMS contains sensor metadata pertaining to the physical device, their deployment and resulting measurement outputs. The SML includes domains describing the physical characteristics of devices, including hardware and software versioning, measurement and/or sample collection characteristics, validation protocols,

ownership and additional technical documentation. We implemented the SML using the Ne04j graph database.

The SML includes tools for capturing and discovering metadata for new and updated versions of sensors. Sensor owners can submit metadata to the SML using a REDCap survey form, which is then curated and stored. Researchers can visualize stored sensor metadata graphically as interlinked nodes of information.



This SML serves as a researcher-facing tool - as a repository of sensor information for researchers to

Figure 1: Example of a sensor's metadata limited to output within the graphical database.

design their exposomic studies and understand their limitations; and an inventory of available sensors for prospective study deployments. It also serves as a source of metadata store for the UPIE for performing semantically consistent metadata driven integration of heterogeneous sensor data streams for exposomic study analysis.