

THE NEUROSCIENCE INFORMATION FRAMEWORK (NIF): A UNIFIED SEMANTIC FRAMEWORK AND ASSOCIATED TOOLS FOR DISCOVERY, INTEGRATION, AND UTILIZATION OF BIOMEDICAL DATA AND RESOURCES ON THE WEB

CONTACT DETAILS:

**INITIATIVE NAME: NEUROSCIENCE
INFORMATION FRAMEWORK**

NAME: JEFFREY S. GRETHE

**ORGANIZATION: UNIVERSITY OF CALIFORNIA,
SAN DIEGO**

EMAIL: JGRETHE@UCSD.EDU

Objectives:

Neuroscience, as with other biological sciences, has become a data intensive science where new insights and discoveries are critically dependent on researchers ability to integrate and synthesize related biological data. The Neuroscience Information Framework (NIF; <http://neuinfo.org>) was launched in 2008 to address the problem of finding and integrating neuroscience-relevant resources through the establishment of a semantically enhanced framework. To enable researchers to gain access to data and information they may not have been aware of, the NIF has deployed a discovery portal that connects neuroscientists and biomedical researchers to available resources. These sources include the: (1) NIF Registry: A human-curated registry of neuroscience-relevant resources; (2) NIF Literature: A full text indexed corpus derived from the PubMed Open Access subset as well as an entire index of PubMed; (3) NIF Database Federation: A federation of independent databases that enables discovery and access to public research data, contained in databases and structured web resources (e.g. queryable web services) that are sometimes referred to as the deep or hidden web.

On-going activities:

In addition to fielding, maintaining and growing the current NIF system, NIF has outlined a strategy for sustainability through the provision of core services in support of researchers, resource providers, companies, organizations and government entities. NIF assets have been used to quickly jump-start or create other customized portals without needing to duplicate efforts. We've provided these services to individual researchers, organizations like the Spinal Muscular Atrophy Foundation and One Mind for Research, and large projects like the Monarch Initiative and the NIDDK's Information Network. The Monarch initiative (<http://monarchinitiative.org>) aims to provides basic and clinical science researchers, informaticists, and medical professionals with an integrated interface and set of discovery tools to reveal the genetic basis of disease, facilitate hypothesis generation, and identify novel candidate drug targets. DKnet (<http://dknet.org>), the NIDDK Information Network, is meant to serve the needs of basic and clinical investigators by providing seamless access to large pools of data relevant to the mission of NIDDK. Its goal is to develop a community-based network for integration across disciplines to include the larger DK universe of diseases, investigators, and potential users.

Results:

Over the past year, NIF has continued to grow significantly in content, providing access to over 6,000 resources through the Registry, and more than 200 independent data resources in the data federation, making NIF one of the largest sources of biomedical information and one of the largest federated data repositories on the web (Cachat et al., 2012). NIF's semantic search system provides the user the ability to simultaneously search over these sources of information. To support a concept-based search system, NIF employs domain knowledge in the form of the NIFSTD ontologies that enable the query system to interpret a user's search request and convert it into richer yet semantically equivalent searches against the NIF services. The NIFSTD ontologies are a set of community ontologies implemented in OWL covering the major domains of neuroscience, which were assembled from existing ontologies in use in the broader life science community but enhanced with neuroscience specific content. The NIFSTD ontologies are used to provide a semantic framework for searching and annotating diverse content.

URL: <http://neuinfo.org>