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MemRE: An integrated research environment for multidisciplinary collaboration

This poster details the motivations and rationale for the design and implementation of the Membrane Research Environment (MemRE), a component infrastructure project of the Australian national collaborative Advanced Membrane Technologies for Water Treatment Research Cluster. The research cluster brings together a multidisciplinary group of researchers including computational and physical chemists, physicists, material scientists, and chemical and mechanical engineers. The primary goal of the cluster is to develop novel membrane materials in order to reduce the energy associated with desalination by 40%.

Common hurdles in multidisciplinary research projects include: lack of consolidation of existing information relevant to the research of all the participating fields; absence of information infrastructure to facilitate comparison of experimental results; and the need for a common language to better enable project participants to communicate. MemRE has been designed and implemented as a solution to these hurdles, to provide an integrated research development tool and learning environment.

MemRE was developed with three independent, though inter-related components: a repository of publications, including reports and conference proceedings not previously available in digital formats; a repository of membrane material data relating to their properties, characteristics and function; and a wiki for online collaborative research and exchange of information on membrane properties, their characterisation and visualisation methods. The materials and publications components comprise a web-based search and discovery interface based on a Fedora repository. The materials repository uses the MatML metadata schema. The wiki was built on the mediaWiki platform.

Functionality of the submission process for the publications repository includes a direct link to materials in the materials repository, and the submission process for the materials repository includes retrieval of data from the wiki. Access to MemRE, via a single sign-on to all three components, is currently restricted to cluster members, however, at the conclusion of the project in May 2010, content will be made freely and publicly available online.

The poster will outline the planning, design and implementation phases of MemRE as well as additional functionality currently being developed for the project. Developments include functionality for capturing and recording the research process to facilitate the reuse and exchange of data.

Summary

MemRE is a component infrastructure project of the Advanced Membrane Technologies for Water Treatment Research Cluster, funded under the Commonwealth Scientific and Industrial Research Organisation (CSIRO) flagship Water for a Healthy Country. It was developed to support collaborative multidisciplinary research of Cluster members across nine Australian universities. The poster outlines the planning, design and implementation phases of MemRE as well as additional functionality currently being developed for the project.

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