

# Ziyu Zhao - Profile Section

Ziyu's interest is in the interpretation of industry data and reasoning within the knowledge domain of engineering. This is a complex application field where relatively little work has been done due to confidentiality restrictions on industry data. It is challenging to handle the many different ways natural language expresses the same information need due to the nature of language.

Some specific general challenges are:

1) to generate the semantically equivalent expression for various natural language utterances, in other words, to identify different mentions of the exact technical words and matching different representations of technical words/terms and relationships, as well as detecting erroneous representations of those words /phrases such as spelling errors and spelling incomplete, and out-of-date data,

2) to obtain the capability of reasoning by incorporating domain knowledge.

Ziyu is completing her PhD with Associate Professor Wei Liu, Dr. Tim French and Dr Michael Stewart at the University of Western Australia.

## **PHD Research - Exploiting Domain Knowledge for Neural Technical Language Processing**

Ziyu's research will incorporate domain knowledge into neural models for technical language processing. To accomplish this, she aims to answer the following questions:

1. How can we represent and make use of factual domain constraints, such as asset hierarchies, to benefit neural learning models in technical text processing?
2. How can we model and represent uncertainty in the domain constraints and technical text?
3. How can we expand and improve domain knowledge using the regularities learnt from neural models?

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Ziyu is specifically focusing on data in the maintenance domain. Unstructured textual data accounts for a significant proportion of all data and is a vital asset to understand and improve maintenance processes. Ziyu has developed a pattern-based interface and is looking at the data construction for modelling the dependency between natural language utterance and schema over structured data and she will be researching a way to incorporate domain knowledge as background in order to get the capability of reasoning. The successful application of Ziyu's research will improve machine readability and the retention of semantic intent of engineering texts for machine learning purposes.

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