Ryan Leadbetter - Profile Section

Ryan completed his studies in mechanical engineering with first-class Honours at Curtin University in June 2019. His Honours thesis was a multidisciplinary project that used machine learning techniques to predict the forces experienced by ballerinas. The data was captured during training, and the results will be used in clinical assessment.

Ryan has most recently worked for Integrity Engineering Solutions as an undergraduate engineer in research and development, as well as in consulting for pressure vessels and pipelines. He has also had previous engineering experience from GHD and Verve Energy (now Synergy).

He has worked in diverse fields, including academic research, engineering and service industries, and the energy generation sector. He has also had exposure to data science and machine learning, biomechanics, consultancy, and research and development.

Ryan is undertaking his PhD under the supervision of Dr Aloke Phatak (Curtin). He is focusing on research in Theme 2: Support the Engineer. Ryan is currently placed with Roy Hill completing a placement on Fixed-Time Roller Replacements.

Ryan also assisted BHP with the reliability analysis of the idlers of overland conveyors to inform a fixed time replacement strategy. BHP previously performed a survival analysis of idlers, and using these results have implemented a fixed time replacement strategy on several conveyors across multiple sites.

PHD Research - Decision Support for Prognostics of Complex Systems: A Practical Approach Using Bayesian Networks.

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Research on prognostic health management tools for use in condition-based maintenance policies offers to increase the availability of assets while also decreasing maintenance costs and unplanned downtime events. However, these benefits have not been seen by the mining industry because these tools are not compatible with the common industry practice of condition-based maintenance. For such benefits to be realised in the mining industry, new tools are needed that can combine heterogeneous data and expert knowledge for prognostics of complex systems. Bayesian networks are a possible approach which can fill this gap, but they have not been used to model complex mining assets for prognostic health management.

Ryan research will build a decision support system for prognostic health management that will provide clear guidelines for companies to follow in order to move towards an effective company-wide condition-based maintenance policy.

The use of a decision support system will allow engineers to:

1) quickly assess the current and forecasted health of an asset given the available evidence and the planned operation,2) hypothesise which components are most likely to be contributing to poor overall asset health, and 3) model the effects of different modes of operation on the likelihood of asset failure. This information will assist planners with critical maintenance decision making

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