

An Indian-Australian research partnership

## Project title

**Data Location in Complex information Networks**

**Project number:** IMURA0068

**Monash University supervisors:** Professor David Abramson and Professor Mohan Krishnamoorthy

**Monash University contact:** Professor IT Faculty;

**Email:** David.Abramson@infotech.monash.edu.au

**Monash University contact:** Professor and Associate Dean of Research (Engineering);

**Email:** Mohan.Krishnamoorthy@adm.monash.edu.au

**IITB supervisors:** Professor Narayan Rangaraj Prof. Vishnu Narayan

**IITB contact:** Convenor, Industrial Engineering and Operations Research Programme

**Email:** narayan.rangaraj@iitb.ac.in

---

## Research Academy theme/s

List only the research academy theme/s that is relevant to the project

1. Advanced computational engineering, simulation and manufacture

## The research problem

With the advent of the Internet, there are a lot of data around these days and there is more being created by the minute. Information sharing via the Web has risen to dominance in the last few years due to applications that are data hungry. Moreover, as enterprises become more and more global, there is more data that is generated from within large enterprise-wide software programs. Large data warehouses are routinely accessed by companies all around the world. This access needs to be speedy and efficient in terms of both time as well as access. As Internet-based “services” become more and more prevalent, it is important to optimise the location of data warehouses in large and complex information networks. This will increase the availability, reliability and accessibility of such data. In order for this to happen, latency and cost of access needs to be minimised. Mirroring is one of the techniques to satisfy such a need. Enterprises need to locate mirrors optimally. Moreover, depending on usage patterns from around the world, the location of these mirrors will change over time. What is needed is a method, model and implementation framework for locating, migrating and managing data-mirrors based on the dynamic monitoring of users’ requirements.

It is possible that this problem can be modelled as a Stochastic Hub Location Problem. Solution approaches are expected to be both heuristic methods as well as exact solution approaches to this large and complex problem.

## Project aims

The aim of this project is to design better ways to locate data mirrors in widely distributed and routinely accessed global data warehouses.

## Expected outcomes

The project outcome is expected to be cost and latency minimisation in complex and large data warehouses through optimally locating large data volumes.

## Which of the above Theme does this project address?

Advanced computational engineering, simulation and manufacture

**How will the project address the Goals of the above Themes?**

Our approach will lead to optimal modelling of information stores in large and distributed global organisations. Our approach will build an abstract an mathematical model and will build computational algorithms/methods for solving these models. We will test these approaches on data from industry – most likely the telecommunications industry.