

## **Motivation**

### **What is the content of CSE?**

CSE is divided into two parts – Operating Systems and Networks. At SUTD we combine these two subjects into one course, covering the essentials of each and also laying a foundation for higher level courses such as Software Engineering, Networks and Computer Security.

### **Why is it important to study CSE?**

This must be addressed in two parts, first for Operating Systems and then for Networks.

An operating system is actually a very special and sophisticated program. Why then should we study a program? The answer is that in doing so, we gain a perspective of the issues and complexities of bringing together computers, peripheral devices and user. This understanding and knowledge is a critical foundation for any higher level abstraction that we may want to lay down, such as resource management, distributed systems, client-server systems and so on.

Networks are of fundamental importance these days. In CSE we look at Networks from a top-down, end-user perspective. We feel this is better than a bottom-up approach, since all of us have experience with the topmost level, i.e. the application level. Now in the course we get a chance to 'look beneath the hood', figuratively speaking.

Finally in bringing the two parts together into one unique course, CSE provides the student with a unique opportunity to understand not only how to manage resources on a single computer, but also how computers are networked together, and the complexities of managing security on the Internet.

### **How can I apply CSE?**

Computers have become an indispensable part of today's life. Hand in hand with the explosive growth and application of computers, computer security or to be more precise, cyber security has become one of the biggest threats in modern living. Knowledge from CSE gives an understanding of how security problems are manifested and approaches towards resolving them.

Another area of explosive growth is Artificial Intelligence. Increasingly, parallel algorithms are being implemented and tested for the spectrum of uses of AI. Knowledge from CSE will help the student understand how and when to use parallel or distributed computing to solve AI related problems. Knowledge of processes and threads, for example will help students to bring their understanding of parallelism in the problem setting, into a computer algorithm that can potentially run on multiple hosts.