

# Why graphs?

Graph algorithms are endemic – and many real world problems can be solved using off-the-shelf graph algorithms software.

Learning to communicate a real world problems as a graph-theoretic problem, and then figuring out what software to use to solve it, will make your life simpler!

On the other hand, many graph-theoretic problems are **NP-hard** – which in essence means you probably can't solve them exactly in polynomial time (more on this later in the course).

Knowing when a problem is NP-hard will also save you a lot of time (because you won't try to solve them).