Mission:Impossible

In each episode of Mission:Impossible, the M:1 team have a seemingly impossible task to perform, which of course they duly do. They achieve these feats using not only Tom Cruise/Ethan Hunt heroics and clever plans but also hi-tech gadgets that help make the impossible mundane. Is there nothing that hi-tech coupled with smart people can't overcome once we set our minds to it?

The massive progress being made as computer science rapidly changes the way we live makes it seem anything is possible. Computers can now fly a plane across the Atlantic, including taking off and landing, with no human intervention. They can beat the best human at chess. They can store my whole music collection in my pocket. Computers can recognize faces, tell me which way to drive to get home ... When in the past people have made predictions about future technology things that would never happen they have tended to end up looking foolish. With a bit of ingenuity in the future computers will solve any problem we want them to ... won't they?

Lots of problems, are 'uncomputable' – they can never be solved even by hyper-intelligent beings from the planet Vorg

It turns out though that some missions really are impossible for computers and even Tom Cruise wouldn't be able to make a difference even if he was given unlimited time. Not now, not ever...and just to hammer it home, this is a fact that was proven mathematically way back in the 1930s before any one had even created an actual working computer...

Computer Science is not just about what computers can do, but also about what they can never do, which is where the bad news for the Mission:Impossible team comes in. Computer scientists have shown that lots of problems that must have solutions are 'uncomputable' - they can never be solved using computers however powerful. Uncomputable problems are not just ones that computers can't solve either, humans can never know the answers, nor can hyper-intelligent beings from the planet Vorg.

What kinds of problems? You might hope that they would be ones that sound impossible from the outset, like cracking the Dr Who Skasis Paradigm that will give you power over the whole of time perhaps? It turns out that even some innocuous problems will never be solved (see page 17 for one to do with Jigsaws)...and in some cases they go to the heart of what we would like computers to be able to do for us like guaranteeing the programs we write do what they are supposed to, or proving mathematical facts from premises (see page 17).

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So remember, if you ever join the Mission:Impossible Team, there are some missions that, once that tape has self-destructed, the only thing to do is just say "cop that for a lark" and go home. The good news is there are still lots of exciting computer science missions that aren't impossible...should you choose to accept them.