

# Balls, bots & Hephaestus

**As I write this, supporters of the England football team nervously await how the team deals with the highly organised 4-4-2 system of the Swedes. As you read this, perhaps England has gone all the way and 52 years of hurt are over. Or perhaps not. Either way, we take for granted the high definition pictures of the game that are routinely transmitted, so we can delight, or agonise, over each super slo-mo replay of the action**

One angle that is relatively new is provided by the overhead camera, that sometimes comes into shot itself, suspended over the playing area by wires. This camera system is known as Spidercam and it operates using four motorised winches positioned at each corner of the pitch, each of which controls a Kevlar cable connected to a gyro-stabilised camera-carrier, or dolly. By controlling the winding and unwinding of the cables, the system allows the dolly to reach any position in three-dimensional space.

All very interesting, but what has this got to do with installation of windows and curtain walling, I hear you ask? While robots are not commonplace right now in our sector, all the predictions are that they will be used to improve installation productivity and quality and to reduce accidents in the future. Mention of the word ‘robot’ usually brings to mind a humanoid contraption, with two arms, two legs and a head<sup>i</sup>, and while such robots may find a place in the glazing sector, it is the cable-driven parallel robot (or cable robot) which uses the same principles as Spidercam that could find more immediate application.

The capabilities of the cable robot are best appreciated by watching them in action<sup>ii</sup>. They can be programmed to lift, move and place loads precisely, and while the term ‘cable’ may give the idea that the robot swings and sways, through a clever arrangement of the cables the robot is actually very stiff in operation. They are also relatively easy to reconfigure and relocate as needed. Not only could a cable robot be configured to perform pick and place of elements, such as curtain walling modules, but it could also manipulate individual elements for accurate positioning. That is where the God of Metallurgy, Hephaestus, comes in. The Hephaestus project<sup>iii</sup> is currently researching a prototype cable robot, designed to build, repair and maintain a building façade, alongside a prototype building and curtain walling system, suitable for robot assembly. With a cable-driven robot that is designed to work on vertical or inclined surfaces and a toolset that will automate bracket positioning and fixation, the project should go a long way towards automating curtain walling installation, repair and maintenance.

If a future where curtain walling installation can be carried out by robots seems far-fetched, who would have thought that in 2018 the world’s largest taxi firm would own no cars and the world’s largest hotel chain would own no hotels?

**Justin Furness**



**Dr Justin Furness – presenting a technical update to members at the Regional Members' March meeting in Leeds**

“What has this got to do with installation of windows and curtain walling?”

i See for example the Atlas robot:  
<https://www.youtube.com/watch?v=fRj34o4hN4I>

ii See for example the CoGiRo project:  
[https://www.youtube.com/watch?v=An\\_i8xoMXDc](https://www.youtube.com/watch?v=An_i8xoMXDc)

iii <http://www.hephaestus-project.eu/>