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SMART ISN'T ALWAYS SEXY

ANYONE CAN HAVE AN IDEA; MAKING IT A REALITY TAKES EFFORT. THIS ISSUE, WE LOOK AT THE DEDICATION AND HARD WORK OF SOME OF THE WORLD'S TOP UAV INNOVATORS

Innovators is a 'sexy' word. It suggests people developing fresh, exciting new ideas that will revolutionise the world as we know it. They're the kind of people who get films made about them: *Steve Jobs; Lorenzo's Oil; The Aviator; The Story of Louis Pasteur* and *Marie Curie*.

And that's all for the good. The world needs innovators, not just to open up new possibilities but to overcome the serious challenges we all face. If innovation looks sexy, it'll attract potential innovators.

But scratch beneath the surface and innovation suddenly can look a lot less glamorous. Once someone has an idea, to change the world, it has to become a reality. That takes hard and frequently unglamorous work. And this issue, we look at those UAV innovators who are braving danger, disasters and the elements to revolutionise the world.

One of the largest and most well known applications of UAV technology in both the civilian and military worlds is surveillance. Whether it's monitoring pipelines, defence installations or ships at sea, UAVs can remain in the air covertly for long periods of time, without risk to an on-board pilot. To do this, many trade-offs have to be made regarding payload, power, size and more, all of which affect the UAV operator: the UAV may be unmanned but someone has to monitor it from the ground, often in unpleasant surroundings, not just to guide it but to look at its imagery to determine whether an object is a potential threat or merely, for example, a sand dune or a friendly, harmless whale.

One possible way of helping these operators is automatic recognition of objects using real-time image processing. If the UAV's on-board computer can recognise potential threats and even determine for itself what's a real risk and what's not, it could more or less fly itself, while the UAV operator can get on with other things, preferably in safer surroundings.

But if it were that easy, everyone would be doing it and there's both science and art required to make this kind of analysis. On page 24, Philippe Roy looks at one of the techniques finding success and explains how it's being improved.

While the lightness and flexibility of UAVs is making certain kinds of aerial photography possible that were never possible before, often in remote regions, the flip side is that someone has to go to those remote regions, taking all their equipment with them. Bolivian farmers once emulated the activities of animals classed as 'earth engineers', such as worms and small mammals, by conducting 'raised field' agriculture that worked in harmony with nature. Now Bolivia wants to preserve their mounds, the first step of which is to measure their extent. But even trees can hide them from aerial eyes, meaning only low-flying UAVs can properly photograph them.

On page 28, Bruno Roux explains how he and a fellow team member went to the northern regions of the country in its dry season, lugging kilos of equipment in 40ºC heats, to do this. It wasn't glamorous, but it got the job done.

The simplicity of UAVs means that anyone can learn to fly them very quickly. With additional training, people can even learn to fly them in a way that's suitable for surveying. That means that they can potentially become the first line of image acquisition in the event of an emergency, with volunteers and first responders able to acquire imagery themselves from as near to the event as possible.

It's a strategy that paid off in Nepal, following the recent earthquakes, as Krista Montgomery reports in our cover story on page 30. To help assess the damage to remote villages in Nepal, Kathmandu University trained volunteers and students in how to use UAVs to acquire the necessary imagery. Working their way through devastated and dangerous areas, they were quickly able to put their training into practice.

Thomas Edison – another innovator whose life story was recorded in a movie, Edison, The Man – once said: 'None of my inventions came by accident. I see a worthwhile need to be met and I make trial after trial until it comes. What it boils down to is one per cent inspiration and ninety-nine per cent perspiration.' And that's as true today as it was nearly 100 years ago.

I hope you enjoy the issue.