

Business » Innovation » Commercial Profiles »

Like Confirm Tweet 6 +1 2 6 | Print | RSS | Text Size: A - A

The Irish Times - Friday, August 26, 2011

Building the networks of the future

We are increasingly dependent on the infrastructure of our information networks, but to get the most out of them we will need novel ideas to maximise their capabilities. An Irish research centre is leading some innovative approaches to do just that

IMAGINE NEVER BEING held up in traffic again because of a hole in the road dug by a telecoms company. Given the almost continuous excavation activity of the companies and their contractors this might appear to be an impossible dream.

But it could be a reality thanks to the work of the Science Foundation Ireland Centre for Telecommunications Research (CTVR) which specialises in designing the wireless and optical networks for the future.

But the CTVR is involved in far more than just developing smart pieces of technology to improve network speed or capacity. It has developed particular expertise in the kinds of technologies that will make networks flexible and evolvable and able to withstand change.

"We live in a time of unprecedented change," notes CTVR director Prof Linda Doyle. "Traffic on our telecommunication networks has grown exponentially in the past decade. Many of the services and applications that exist now were not even imagined a few years ago. Though we can extrapolate some trends and make educated guesses, we cannot predict exactly what lies ahead. It's really hard to predict the future; you could be designing the next legacy network without knowing it."

CTVR is designing networks with change in mind. These will be more robust to disruption caused by growing demands and changing user patterns and as yet-unimagined applications. The risks associated with investment in these kinds of networks will be lower as they will be more durable and scalable. Such networks will also make more effective use of resources such as radio spectrum, bandwidth, power, processing capabilities, cooling capabilities and so on. CTVR's approach to designing for change is focused on creating networks that are evolvable, sustainable and submissive.

Headquartered at Trinity College Dublin, the centre is a collaborative effort between six other universities and research institutions, including National University of Ireland, Maynooth; Dublin Institute of Technology; Dublin City University; Tyndall National Institute in Cork; University College Cork; and University of Limerick. Industry partners include Alcatel-Lucent/Bell Labs Ireland; Xilinx Research Labs Ireland; Socowave; Eircom/Meteor; this year's Irish Times Innovation award winners InTune Networks; NXP and MA/Com.

All told, there are 16 academic faculty members involved from across the different institutions. There are between 22 and 32 postdoctoral researchers and between 38 and 50 postgraduate students involved at any one time. "There is one CTVR with seven core industry partners, more than 30 other industry partners via other direct engagements such as EU FP7 projects, over 809 companies have attended our events, we have had meetings with another 120 and generated well over 1,000 ideas as a result."

Prof Doyle explains that the centre is involved in four key areas of activity: leading edge international research; carrying out meaningful research for industry partners; technology transfer; and education and outreach.

In this section



- Capital celebrates innovation
- How to win overseas

ADVERTISEMENT

Latest

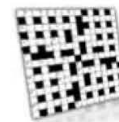
- 13:33 Cameron 'reneged', say Finucanes
- 13:22 Lawlor signs off 'Morning Ireland'
- 13:14 Former TD Michael Fitzpatrick dies
- 13:11 Dana to clarify candidacy today
- 13:08 Reform needed for credit unions
- 12:26 New tourism initiative announced
- 12:12 Banks' emergency funding 'steady'
- 12:03 Euro zone inflation accelerates

Popular Stories

Most Read | Most Shared

- RTÉ treatment of McGuinness generates over 100 complaints
- Minister dumps documents in park bin
- Dana bombshell another twist in the tale
- Marathon cheat caught taking bus
- Judges to end tradition of wearing wigs in court today

Crossword Club »



Today's Interactive Irish Times Crosaire and Simplex crosswords, plus 10 years of crossword archive.

Mobile Services »



News alerts and crossword solutions to your phone.

epaper »

THE IRISH TIMES epaper Read the print edition on screen

ADVERTISEMENT

"What we are doing is looking for the best way to design and build the networks of the future," she adds. "They have to be sustainable and evolvable. When we talk about sustainable we don't just mean power, we mean all resource constraints such as spectrum, bandwidth and so on. They also have to be submissive. If you look at what's happening now you'll see that business models are breaking down. It's very hard to design bias out of a network. We want to design networks that are unbiased to any particular business model and make it submit to any models that might evolve in the future."

This includes models of multiple and collaborative ownership which are beginning to emerge. The networks of the future will be designed with the capability of different parts of them having different owners, or even shared ownership with no impact on performance. They will also be able to take advantage of new resource streams as they become available.

"We think about the architecture of the networks as well as underlying technologies," Doyle points out. "We are researching areas like cognitive networks, long-reach passive optical networks, flexible radio, tunable lasers, wideband antennae and so on. We look at the big picture and all of the technologies that underlie it."

Cognitive radio is a particularly exciting technology. "Mobile phones will be much smarter in the future and they will be able to seek out resources. Cognitive radio will be able to find spare, unused spectrum and use it until its owner wants to use it again."

This notion of collaborative consumption is driven by growing demand for ever more scarce resources. "It is quite a challenging concept," says Doyle. "It's a bit like saying to somebody that while they are at work a homeless person is going to use their house. In the case of the mobile phone it's a bit like using someone else's parking space and paying a small boy to alert you to when they or the clumpers are coming so you can get out in time and find another spare space. This requires a big change in our mindsets and a rethink of the concept of who owns things. We are developing technologies that allow this sharing."

In the technology transfer area the centre has licensed a large number of inventions including the antenna used in the Luas smartcard reader system. And its cooling technologies may well end up in the smartphones of the future.

Interestingly, the CTVR has spawned a campus company, Xcelerit, which is engaged in a technology apparently unrelated to the core communications and network research of the centre. "It's engaged in parallel computing," says Doyle. "Parallel computing is a lot faster than serial computing and is used for very complex financial or physics calculations. Through our work on radio we are constantly looking at parallel platforms and that's how Xcelerit came about. That's the great thing about SFI. They let you pursue research to wherever it takes you."

The centre is also engaged in some quite innovative education and outreach work – some of it based on A Communications Primer, a 1953 film about communications made by noted chair designers Ray and Charles Eames. "We do a lot of work getting people to think differently about networks," Doyle says. "At last year's Young Scientist exhibition we got the kids to draw the internet and how they imagined it to look like. More than 200 kids turned up at the stand and did drawings. We go out of our way to reach out and engage with the wider community."

One other area of importance to Doyle and the CTVR is public policy on telecommunications. "This matters a lot to us. We need to change policy here in order to encourage innovation. There are lots of possibilities here. For example, Ireland is a very small place and we can use this to our advantage. We have unused spectrum here and we could use that to encourage companies to come here and use Ireland as a sort of 'spectrum playground' for research and development work."

She says the success of the centre since its foundation in 2004 is largely due to teamwork. "The CTVR is very much a team and the people on it have to work twice as hard because our activities are so distributed. It takes a long time to get really good collaboration and that's what we have here."



ADVERTISEMENT

[Ads by Google](#)

Dublin Coupons

1 ridiculously huge coupon a day. Get 50-70% Off Dublin's best!
www.groupon.ie/Dublin

Volvo Ireland

Browse Our Entire Range Available In Ireland or Request a Test-Drive
www.VolvoCars.com/ie

Rheumatoid Arthritis?

Forex Trading Explained

Free Trading Course & Demo Account Trade FX, CFDs, Gold, Silver & Oil
www.CMCMarkets.ie/Forex

Google Apps Webinars

Learn how Google Apps can Benefit your Business. Register Today!
www.google.com/apps/webinars

Investing in Stock Share?

Get Advice from Standard Life's Financial Advisers & Pick a Scheme!
www.standardlife.ie/investments



AdChoices