Postcard From Oulu, Finland

Therese Catanzariti Oppermann reviews developments in 4G telecommunications research in Finland.

In June 2002 I met a guy at a party. We started chatting and he told me he was moving to Finland. Now, here I am in Oulu, 600 km north of Helsinki, next door to Lapland and 160 km south of the Arctic Circle, taking a year's break from being a barrister.

Oulu's centrepiece is the Technopolis, a science park for ICT industries and home to hi-tech companies such as Nokia Mobile Phone R&D, a VTT research centre (VTT is Finland's CSIRO), Elektrobit and NetHawk who supply technology for wireless networks, and Oulutech, an incubator program for start-up companies.

The University of Oulu is a leading science and technology university. The guy I met at the party is the director of one of the university's research centres, the Centre for Wireless Communications **(CWC)**.

CWC provides an interesting insight into how Europe, and Finland in particular, finances and conducts telecommunications R&D. CWC's research is targeted and industry based. Funding is important but forms only one part of the equation. The key is relationships, partnership and co-operation, between local and foreign universities and industry. CWC leverages research, skills, resources, people and financing throughout Finland, Europe and the world.

CWC's main areas of research are 4G technology and Ultra Wideband.

For those like me from the M part of CAMLA… Until recently, 2G was the current generation of mobile phones. 2G is voice-oriented with a low data rate, up to 12 kb/s. The most common form of 2G is GSM.

2 ½ G (also known as GPRS) uses the spare capacity in GSM. It aggregates the voice slots to increase the data rate to around 60 kb/s.

3G is primarily data-oriented, although it still has voice. It has much higher data

rates, theoretically up to 2Mb/s, but in practice up to 384kb/s, and most commonly 64kb/s. This is why you can stream video on 3G.

However, all of these structures (2G, 2 ½ G and 3G) are conventional cellular structures. Thus each user has to rely on a base station, and the data rate decreases as you move away from the base station. This means that there are islands of capacity depending upon where the base station is.

4G augments the coverage of a conventional cellular structure. If you have a wireless LAN network like a 802.11 system each user's device acts like a little base station. You can create capacity in the particular region through the presence of other users. Therefore, capacity exists where the users are, as opposed to where the base station is. This leads to ad-hoc network structures as the users move around. The users are the network.

Users can talk to each other if they are within a certain proximity of each other, even if there is no base station. However, they still need to use the base station if they want to talk to someone far away. This is why they *augment* the coverage of the structured cellular system.

4G is all data, with voice being one form of the data. Phones become data terminals. Data rates are much higher, with a maximum of 100Mb/s for a mobile device, and 1Gb/s for stationary devices.

However, 4G will only work if the system is spectrally efficient in term of bits per second per herz. This means that the system needs sophisticated

signal processing techniques. These techniques include MIMO (multiple input, multiple output), space-time coding, multi-carrier CDMA (code division multiple access), OFDM (orthogonal frequency division multiple access), adaptive radio links and SDR (software defined radio). These techniques are at the limits of modern communications science. Without them 4G cannot exist as the data rates would not come within the bandwidth restrictions. CWC is heavily involved in research for these techniques, and establishing a multi-million euro 4G lab to investigate key enabling technologies.

Ultra Wideband is a radio technology suitable for ad-hoc networks. It utilises a bandwidth of as much as 7.5 GHz (between 3.1 GHz and 10.6 GHz). This is 1500 times the bandwidth of 3G systems. The potential data rates are enormous. CWC recently measured data rates of up to 3Gb/s over short distances. Ultra Wideband also offers the ability to trade very high data rates over short distance systems, for lower data rates over longer distance systems.

CWC is completely funded by research projects and is involved in 22 projects this year. With a budget of 5 million euros for this year, CWC has 90 staff, mostly PhD students, post-doc academics and professors. There is a significant number of foreign academics and students, from places such as China, US, Sweden, Sudan, Romania, Serbia, Spain, Japan, Brazil and Italy.

CWC projects include military research for the development of things such as communications systems for fighter jets and ships. CWC also conducts research projects with Finnish companies like Nokia and Elektrobit. TEKES, the Finnish government funding body, provides 60% of research and development funding for such projects on the condition that a minimum of 2 other companies put up the balance of 40%. The results of the research and development are jointly owned by the companies and the university.

CWC is also involved in joint research projects with other European universities and companies that are generously supported through EU funding. The project model is collaborative research involving a number of competitor companies rather than individual competitive research. For example, CWC is involved in a project called PULSERS which augments 802.11 technology (such as WiFi and Bluetooth) with Ultra Wideband technology. The project partners include companies such as IBM Switzerland, Phillips UK, ST Microelectronics Switzerland, Motorola France and Telefonica Spain, and universities from Rome, Dresden, Karlsruhe and Finland. The project's budget is 45 million euros, with the EU providing roughly 50%.

Further abroad, the CWC also has a number of projects with companies in countries such as the USA and Israel, and universities including Yokohama and Osaka in Japan and MIT in the United States.

Yes, it is cold here. Today it reached -12 degrees Celsius!

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The Plot Thickens Formats, Sequals and Spinoffs After Goggomobil

Therese Catanzariti Oppermann reviews the recent Telstra Corporation Ltd v Royal & Sun Alliance Insurance Australia Limited decision.

The film and television industry trades in intangible rights. Format rights and the right to produce sequels, prequels, spin-offs and remakes are notorious smoke and mirrors. Demands are made, deals negotiated, letters exchanged, contracts executed, money paid. If anyone asks any questions someone might mutter something about Jaws,[1] whilst others might mumble in reply about a New Zealand clap-o-meter.[2] The recent matter of *Telstra Corporation Ltd v Royal & Sun Alliance Insurance Australia Limited* [2003] FCA 786 **(Goggomobil)** offers rare insight into this area of law.

AUSTRALIAN PRACTICE

Investors in Australian film often require the producer to assign to them the "ancillary rights" in the film, and to provide the investors a chain of title opinion letter from a lawyer confirming that the producer owns the ancillary rights. The ancillary rights include the right to produce or authorise the production of sequels, prequels, spin-offs and remakes.

Investors maintain that the revenue generated by formats, as well as sequel, spin-off and remake rights are a product of their investment in the initial film. The investors reason that the assignment of such rights to them serves to protect their right to share in the further revenue.

GOGGOMOBIL CASE BACKGROUND

In the *Goggomobil* case, the Federal Court was asked to consider whether certain advertisements for Royal and Sun Alliance trading as Shannons Insurance **(Shannons)** infringed Telstra's rights in a Telstra Yellow Pages **(Yellow Pages)** television advertisement. Shannons' advertisements were created by Wilson and Everard **(Wilson)** and aired on both television and radio. Telstra alleged that