Ryerson researchers are building an intuitive communication interface

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Computer science professor Hossein Rahnama, who is also research director of the university's Ubiquitous Computing Group (UCG), and head of research and innovation in the Digital Media Zone, leads a team that's developing the next generation of voice and video communication networks.

Your cell phone rings during an important meeting. Heads turn, eyebrows are raised, and everything could have been prevented if you had silenced the phone's ringer. Or soon, thanks to an international Ryerson collaborative research project, your phone will consult your daily schedule, location, and the profiles of the people around you, and decide if the call should be sent directly to your voice mail or should be redirected to someone else. What's more, your phone will also intelligently determine if the call should be handled over Wi-Fi or regular telecommunications channels in order to provide optimal voice and video communications at the lowest cost possible.

The project is led by Hossein Rahnama, a professor of computer science and research director of the university's Ubiquitous Computing Group (UCG). Rahnama is also head of research and innovation in the Digital Media Zone (DMZ), Ryerson's business-and research-enterprise incubator. Together with Ryerson graduate student Petar Kramaric, Computer Science '09, DMZ Projects Officer Jon Suer, computer science student Damyan Petkov, Stephen Johns, Computer Science '10, and 12 other researchers at the DMZ, Rahnama is breaking ground in context-awareness – a new communications innovation that gives mobile-device users more control over how, when, and where they receive voice and video calls.

To ensure a global reach for their technology, Rahnama and his colleagues are forming a partnership with Morodo, a United Kingdom-based communications company with offices around the world. Morodo is allowing the researchers to make use of its vast global network while the context-awareness technology undergoes further development.

"Each 'context' refers to user-and situation-specific information, such as your location and calendar of activities," Rahnama says. "We are building an intuitive and image-based interface that takes these contexts into consideration, enabling people to set their own rules and preferences about how others can communicate with them."

For example, he explains, programs like Skype and Windows Live Messenger facilitate instant, text-based communication. With this technology, however, users would no longer be limited to traditional, text-based options when grouping personal and professional contacts on mobile devices or social networking websites. Instead, groups of friends, family members and colleagues can be sorted visually, using pictures, graphics and their situational information such as location, calendar information and their communications bandwidth.

Furthermore, depending on the receiver's location and the most cost-efficient channel of communication, calls can be routed through a Wi-Fi or mobile-phone network, or through a social-media platform, such as Facebook. So during a conference call, for instance, the conference call organizer can invite participants to connect by joining the meeting's group on a social network, rather than calling each person individually.

These new possibilities offer myriad benefits. To start, the technology offers a more stable, reliable and cost-efficient form of voice and video communication – one that is ideally suited to social media websites and mobile platforms, and reduces long-distance roaming charges. Also, gone would be the days when a call comes in at an inconvenient time, such as when driving. Depending on your current GPS location, such as a library or four-lane highway, calls can be forwarded immediately to voice mail.

"The future of voice and video communications is mobile, social, intelligent and situation aware," says Andrew Reid, chief executive officer of Morodo. "That's the reason that we have decided to collaborate with Ryerson to build the next generation of voice and video communications networks. Ryerson is a leader in context-aware computing and Morodo has been on the forefront of virtual telecommunications in Europe, having an active customer base of mobile users in over 120 countries."

Provided by Ryerson University