



First R&D Network dedicated to aid Persons with Disabilities

The ICAST Research and Development Network is the first network dedicated to a long-term vision for science and technology to aid persons with disabilities and impairments of all types. Immediate goals include: grow the size of the national network specific to this mandate; facilitate networking among researchers, companies, advocacy groups and clinicians (knowledge and needs exchange); help coordinate research to get better economic benefit from dollars spent; advocate for ways to engage industry in a more effective way; and, provide a mechanism and encouragement for user/advocacy groups to provide greater input to research priorities.

Unique Multi-Disciplinary, Multi-sectoral Structure

This multi-disciplinary, multi-sectoral network has a unique structure. Due to the nature of its goals there is a large overlap among problems, technologies and markets. As a result, the ICAST network is a network of overlapping research and development clusters. For its first phases, there are four such clusters, one each for mobility issues, communication issues, smart homes, and elderly issues. Brief descriptions appear below.

The Mobility Cluster

Mobility is essential for quality of life. The ICAST Mobility Group brings together scientists, engineers, clinicians, consumers, and industry to solve mobility issues using robotics, computer vision, artificial intelligence, mechanical design, biomechanics, and rehabilitation science. Innovations in mobility technology will sense their surroundings, make decisions, and act appropriately to allow people with disabilities and the elderly to interact with their chosen environment. This technology will also enable healthcare providers to deliver care more effectively. These devices promote independence and help Canadians overcome limitations.

Examples include stroke rehabilitation, artificial limbs (prosthetics) and braces (orthotics), wearable robotics, intelligent wheelchairs (i.e., self-guided), and wayfinding for people who are blind.

The Elderly Cluster

This research cluster addresses a very broad and difficult challenge, namely, how to provide solutions that actually solve the problems seniors face. Technology for seniors, whether they are aging normally or aging with some level of impairment, must involve minimal user effort, and be very, very simple for users. Cognitive, sensory, and motor deficits take many forms both in degree and in combination. There are also differences in technological comfort and skill among seniors. Thus the overall diversity among seniors' needs and capacity to use technology is enormous.

Examples include medication-reminding systems, prompting technologies to assist during common daily activities, development of new design guidelines for older adults, and personal emergency response systems.

The Communication Cluster

This group will work to address human functional limitations in communication and control, through sensory, motor or cognitive impairment, by providing technologies that will help to overcome challenges associated with these limitations. A *functional limitation* affects an individual's ability to accomplish his or her goals, with "goal" being user-dependent. Examples of *functional goals*: independence, inclusion, participation in and contribution to society and its activities, information access and processing, situational awareness (whether emergency or activities of daily living), and improved quality of life.

Examples include improved access to information society and telecommunications infrastructure, tools for cognitive, linguistic, motor, visual, and auditory impairments.

The Smart Home Cluster

The long-term goal of this cluster is to develop technology that may sustain and improve the quality of life through ecology of cooperating devices, people and applications in a home. Towards this end, the study the ethnography of the home - activities, behaviors, and models - is critical. Research tasks here include the development of a shared infrastructure, the establishment vocabulary of a representation of context, tasks, and activities and the building of mechanisms to interpret and evolve ecology in the home. Due to the diversity of needs, we must develop a broad repertoire of applications that sustain and improve the quality of life that can be deployed and tailored to specific circumstances.

Examples include smart space infrastructures, context-awareness in smart spaces, sensors and diagnostic monitoring aids for the home, and home safety monitoring.



ICAST

R & D Network

Intelligent
Computational
Assistive Science & Technology
Research and Development Network

Managed by the ICAST Task Force

A Chair aided by a Task Force administers the network. Each of the research clusters appointed representatives to the Task Force. John Tsotsos of York University was elected the first chair of the ICAST Network. The Task Force is comprised of:

- Gary Birch, Neil Squire Society, Vancouver
- Christian Cloutier, Systèmes Lifelink, Quebec City
- Pierre Dumouchel, CRIM, Montreal
- Paul Gilbert, Quanser, Markham
- Sid Fels, University of British Columbia
- Ed Lemaire, University of Ottawa
- Nigel Livingston, University of Victoria
- Francois Michaud, University of Sherbrooke
- Alex Mihailidis, University of Toronto
- Mickey Milner, HTX (Health Technology Exchange), Markham
- H el ene Pigot, University of Sherbrooke

The Founding Members of ICAST

The founding members of the network include the following organizations:

Universities

York University, University of Toronto, University of Sherbrooke, University of Waterloo, University of British Columbia, University of New Brunswick, University of Ottawa, and University of Victoria.

Companies

HTX (The Health Technology Exchange), Precarn Incorporated, CRIM, Research In Motion, Quanser, Applied AI, and Syst emes Lifelink.

Hospitals, Caregivers, Clinical Units

The Neil Squire Society and the Toronto Rehabilitation Institute.

The network is expected to grow rapidly and we are soliciting names of interested parties in an effort to be as inclusive as possible.

The Birth of ICAST

The first ICAST Workshop was held at York University, Dec. 4 and 5, 2006, with financial and administrative support from Precarn Incorporated and York University. Thirty-five participants from universities, clinics and industries spent two days discussing ways of improving the development of assistive technologies of all types. The meeting was chaired by John Tsotsos (York University) with assistance from a Canada-wide steering group consisting of Gary Birch (Neil Squire Society), Jim Little (University of British Columbia), Alan Mackworth (University of British Columbia), and Alex Mihailidis (University of Toronto). Credit is due to Alan Mackworth who came up with the idea for this workshop.

The end result was unanimous agreement for the creation of the ICAST Research and Development Network.



For more information or to get involved with the ICAST Network, contact:

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