

Humber College Broadcast-Broadband Convergence (B²C) Lab

Humber College is leading the way towards the development of Canada's first **Broadcast-Broadband Convergence (B²C) Lab** to explore multisectoral data delivery applications enabled by the new *Advanced Television Systems Committee (ATSC) 3.0* television broadcast standard. The ATSC 3.0 standard runs on an IP backbone and shares a common base clock with 5G networks so it can be easily integrated to improve broadcast mobility and convergence use-cases with 5G delivery. Humber's research will include OTA broadcast-datacast applications with global data delivery standards providing seamless integration with fixed and mobile devices across any content environment. The 3.0 standard and its convergence capabilities can play a significant role in drafting the blueprint of Industry 4.0 where data science, AI and machine learning are the bedrock of how industries are being digitally transformed.






Datacasting opportunities can have a wide range of applications from IoT (Internet of Things) connectivity, autonomous vehicles, smart cities, geo-targeted emergency alerting, programmable advertising, distance learning, smart agriculture, forestry and mining and more. **The B²C Lab will be the first R&D test bed in North America equipped with both an ATSC 3.0 broadcast ecosystem and 5G core network.** The core mission of the **B²C Lab** is to position Humber as a leader in ATSC 3.0 convergence technology research and development, creating services and solutions for industry that will foster the potential of a true heterogeneous communications network for data delivery incorporating the best of standards technologies.

Benefits to Companies

Television Interactivity: The convergence of broadcast TV with broadband internet content delivery opens the door to new interactivity in TV programming. Linear TV programming can be designed to integrate with internet delivered content. Other features in 3.0 broadcasts include geo-targeting, addressable advertising (dynamic ad and content exchange) to regain revenue source through a highly personalized advertising experience, hybrid Pay-TV services offering multi-screen bundles with security and DRM, premium tiers of service, multiple camera angles and customization possibilities for sports, essentially TV 'video on demand' – all invaluable resources in revenue growth that can occur in the direct-to-consumer base for broadcasters.

Data Delivery: Internet and mobile networks struggle to meet the ever-increasing demands of streaming video and other bandwidth-hungry content. ATSC 3.0 is currently the world's most efficient one-to-many data delivery system with return channel capabilities via broadband. A managed heterogeneous network that incorporates both ATSC 3.0 broadcast and 5G delivery can serve as a capacity multiplier for end-users and address gaps in network coverage.

GPS Augmentation: Countless industries such as avionics, telecommunications, agriculture, and transportation rely on GPS to enhance productivity, increase safety and improve security. Gaps where GPS is not available through satellite coverage due to jamming or poor reception (underground parking, tunnels, etc.) can be supported with broadcast transmission via ATSC 3.0. The new robust standard can penetrate buildings and concrete, and with precision time protocol inherent in its design, ATSC 3.0 can deliver GPS augmentation and back-up for critical services including transportation.

ATSC 3.0 Features		Advanced Functionality	Industry Applications
Elevated Capacity (Multiple Data Streams)		<ul style="list-style-type: none"> Spatial Scalability Improved Frame Rates High Dynamic Range Wide Colour Range 	<p>Entertainment: New video, audio, and data-casting capabilities, as well as compatibility with existing web protocols open opportunities for immersive customer experience and subscription-based entertainment services.</p> <p>Public Safety & Targeted Emergency Communications: Uninterrupted, direct communication channels and network agnostic casting will enhance situational awareness, emergency messaging and coverage.</p> <p>Advertising & Marketing: Return-channel capability via broadband, audience measurement, and synergies between linear TV & internet based protocols will improve market reach and exposure - enabling personalized experiences / advertising for consumers.</p> <p>Automated Vehicle Services: Data-casting capabilities can deliver in-car infotainment system experiences and telematic services such as map updates, real-time traffic updates, software-firmware updates to fleets and individual vehicles.</p> <p>Smart Agriculture, Telemedicine & IoT Applications: Improved coverage and data-casting capabilities enable automated device activation and monitoring, which can be used for a variety of applications.</p> <p>Remote Learning & Education: Building (concrete) penetration, robust coverage, improved video & audio capabilities will enable new online learning & streaming services that create new enhancements and efficiencies in distance education.</p>
Improved Reception & Penetration		<ul style="list-style-type: none"> Indoor Coverage Mobile & Vehicle Compatible IoT Compatible 	
Advanced Security Encryption		<ul style="list-style-type: none"> Content Encryption Secure Path to Transmission Source Validation 	
Enhanced Accessibility		<ul style="list-style-type: none"> Dialogue Enhancement & Selective Audio / Video Descriptive Services Custom Caption Capabilities 	
Hybrid Broadcast & Broadband Interoperability		<ul style="list-style-type: none"> Internet Protocol (IP) Compatible Shares Common Clock with 5G Return Channel Communication Data-Casting Capability Two-Way Transmission 	

We look forward for the opportunity to engage with you as an industry partner in our B²C Lab development to deliver exciting new innovation in the Canadian marketplace.

To learn more about the Humber B²C Lab announcement including video highlight reel, please visit:

<https://www.atsc.org/atsc-progress/humber-institute-of-technology-and-advanced-learning/>

For further inquiries, please contact Orest Sushko, Humber College B²C Lab Project Lead at:

orest.sushko@humber.ca