A competitive edge for athletes from leading-edge technology

by Terrance Malkinson

Quebec-based Apogee [www.apogee-sports.com] designer of Canada's long-track speed skaters suits for the 2014 Winter Olympics continued development for the 2018 Games. Development costs were funded by "Own the Podium" and the new design was tested in the wind-tunnel at the National Research Council of Canada in Ottawa. As stated by suit designer Stephane Roy, "We have brought into the arms of the suits small ceramic dots, of diameter 1.5 millimetres that give upload very much like the wings on a plane, bringing speed into the suit." Cara Thibaut, Speed Skating Canada's long-track high performance director stated that each suit costs roughly $1,200 to make and is custom fitted to each athlete's body.

Photo: Nathan Denette/The Canadian Press

A George Brown College student originally from Saskatoon created the unique graphics emblazoned on Team Canada's bobsleighs and skeleton sleds. Joshua Dornan, set to graduate in Graphic Design this spring was inspired by a Canada 150 CF18 Hornet that toured across the country last year. Dornan's designs which provide the sleds with their own identities, were unveiled in Calgary in January when the Team Canada bobsleigh and skeleton teams were announced. Kallie Humphries a bobsleigh multiple gold medallist who competed for Team Canada at the 2018 Winter Games, said "it's probably the most Canadian sled we've had at the Games."

Photo: trainwithpush.com

PUSH [www.trainwithpush.com] a Toronto sports technology company, has developed a device that tracks the power of an athlete's movements to complement training methods already used, called velocity-based training. Using a sensor attached to an armband the velocity of an athlete's movements can be tracked. The hardware is made in Mississauga and in Quebec. An app provides instant information to the coach who can then give feedback to the athlete. The companies client list includes NBA, NHL, major league baseball and several Olympic teams.

Two Kitchener entrepreneurs, Andrew Flemming and Geoff Fowler along with business partner Will Hamilton used their creativity to develop an innovative high-tech training device, "SmartBroom" [www.smartbroom.ca] was used by eight of the thirteen national curling federations competing in the Pyeongchang Olympics. Four sensors in the broom head relay instantaneous data to a display unit that includes force in pounds, stroke rate in hertz, and "sweeping performance index," a metric that combines power and speed.

Photo: smartbroom.ca

Precision in timekeeping is essential in athletics. As an example, the difference between the Canadian and Norwegian speed skaters was so small that it took advanced photo-finish technology, which captures 10,000 digital images per second, to determine that the tip of Canadian Ted-Jan Bloemen's skate blade crossed the finish line two one-thousands of a second ahead, earning him the Gold Medal. Omega [www.omegatiming.com], the Olympic timekeeper at the Winter Games since 1936, has by necessity moved well beyond just timing and scoring events. They have expanded their responsibilities to capture all kinds of data for athletes, coaches and viewers, and also produce performance-based data for athletes, coaches and analysts.

In ski race competitions such as downhill, Super-G and slalom, aerodynamics are most important. A podium finish comes down to a hundredth or even a thousandth of a second. The air resistance (drag) of an athlete's clothing influences performance. Before Canada's Winter Olympic team headed to South Korea for the 2018 Games, they worked inside the ACE Climatic Wind Tunnel [ace.uoit.ca] at the University of Ontario Institute of Technology. Alpine Canada and performance wear partner Qwixskinz [qwixskinz.com] used the Wind Tunnel in early October to help tailor Canada's alpine ski suit. Fabrics were tested for fit and performance. Data helped Qwixskinz determine which clothing was fastest and readjusted each athlete's individual suit to ensure optimal aerodynamics. ■

Photo: University of Ontario Institute of Technology

Humboldt Broncos

The Humboldt Broncos Hockey Team tragic bus crash in northeastern Saskatchewan killing 15 young individuals and leaving many other athletes critically injured is one of the worst events in Canadian sports history. The Canadian unit of IEEE expresses its condolences and support to all affected by this event. As evidence of the importance of athletics, Ryan Stranschnitzki, a Bronco defenseman from Airdrie, Alberta, was paralyzed from the waist down. He is already dreaming of one day suiting up for Canada's Paralympic sledge hockey team. Considerable physical and mental challenges will face this young man in pursuit of this new goal. Hockey Canada has indicated that it "looks forward to helping him learn the sport of sledge hockey when the time comes" and further support will come from fellow athletes and the public. The strength of character, which athletes learn through participation, will serve him and the other surviving athletes well in overcoming the effects of this tragedy that has shaken many globally.

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Retired Canadian women's hockey star Hayley Wickenheiser announced on February 7 that she will donate her brain to concussion research after her death. She is one of many athletes who desire to help increase understanding of concussion injury and the resulting chronic traumatic encephalopathy. The Concussion Legacy Foundation [www.concussionfoundation.org] which supports CTE and concussion research says that more than 2,800 former athletes and military veterans have promised to donate their brains since 2008. Many of their stories are profiled on the foundations website. As Ms. Wickenheiser states "by pledging my brain to the Concussion Legacy Foundation I hope to support the best science and accelerate the development of ways to prevent and treat CTE." Halley Wickenheiser, a four-time Olympic gold medalist in women's hockey travelled to North Korea following the Winter Olympic Games and ran practices as a volunteer for North Korea's national women's and men's hockey teams.

A recent article published in *the Globe and Mail* [March 20, 2018. page B9] written by Jennifer Lewington "Niche Degrees Allow Grads to Stand Out"] discusses the growing number of Canadian business schools who are creating new specialty graduate degrees. Many of these are a blend of residential and online program delivery in diverse fields such as data analytics and artificial intelligence to name but two. ■

For **Terrance Malkinson**'s biography please see page 25.