Curriculum Vitæ

David Gerhard, Ph.D.

Professor and Head
Department of Computer Science
University of Manitoba,
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Education

Ph.D. 2003, Computing Science, Simon Fraser University.
Computationally Measurable Differences Between Speech and Song.
B.Sc. Comp. Eng. (Dis) 1996, University of Manitoba.
Lossy Compression of Head and Shoulder Images Using Zerotrees of Wavelet Coefficients.

Awards and Recognition

2018 and 2014 Paragon award of Innovation (University of Regina / Regina Chamber of Commerce)

2016 Award for Excellence in Teaching (University of Regina Alumni Association)

2014 President's Award for Teaching Excellence (University of Regina)

2014 Award for Innovation in Teaching (University of Regina)

2013 *with the Darke Hall Five* President's Awards for Service Excellence: Spirit Award (University of Regina)

Employment Experience

Professor (2022–current) Computer Science, University of Manitoba.
Department Head (2022–current)

Adjunct Professor (2022-2027) Computer Science, University of Regina.

Professor (2003–2022), Computer Science, University of Regina.
Department Head (2019-2022)
Associate member, Faculty of Media, Art, and Performance.

Syndicated Columnist and Media Expert. (2006–current) TV, Radio, Print, Online. Local and National.

Co-founder; Co-owner; Head of research and applied innovation. (2010–2018) Shiverware Interactive Software Developments, Inc (Startup Company: mobile apps, UX, IoT).

Certification and Training: Conflict Resolution, EDI, WHMIS, RPAS-VLOS

Key Service Roles

Boards Digital Integration CoE TAC, CrashBang Labs, Sunset United Church.

Committees University of Regina: Strategic Enrolment Project, Technology Advisory Group, e-proctoring Advisory Group, University Leadership Group

Sabbatical Leaves July 2017–December 2017; July 2009–December 2009

Parental Leave October 2008–March 2009

Selected Research Funding: Awarded

Saskatchewan Health Research Foundation Align Grant *An Early Health Technology Assessment (eHTA) Stakeholder Dialogue to Accelerate Research, Development, and Commercialization of Virtual Reality for Paramedic Occupational Assessment in Saskatchewan.* R. Kyabaggu and 7 others. ($10,000) 2022

MITACS Accelerate *A Feasibility and Usability Study of Virtual Reality Assessment for Paramedic Occupational Competency (VAPOC) in Saskatchewan.* R. Kyabaggu and 7 others. ($100,000) 2022

Public Works Canada and the RCMP *A Longitudinal Study of Operational Stress Injuries (OSIs) for the Royal Canadian Mounted Police.* R. N. Carleton and 17 others ($2.3 Million) 2021

President's Teaching and Learning Scholars Program *Virtual Reality in the classroom: Augmented Learning* D. Gerhard ($4000) 2019

Private Donation *in support of Virtual Reality Research* D. Gerhard ($5000) 2019

Public Works Canada and the RCMP *A Longitudinal Study of Operational Stress Injuries (OSIs) for the Royal Canadian Mounted Police.* R. N. Carleton and 17 others ($8.8 Million) 2017–2021

Own the Podium Innovations for Gold *Swimming Analytics.* J. Barden and D. Gerhard ($100,000 per grant) 2017, 2016, and 2015

Canadian Institutes of Health Research (CIHR) *Enhancing internet-delivered cognitive behavioural therapy.* H. Hadjistavropoulos, 13 co-applicants ($971,552) 2017-2021

Saskatchewan Health Research Foundation (SHRF) Collaborative Innovation Development. *Developing and Evaluating Online Treatment for Children with Anxiety.* L. Loutzenhiser and 8 others ($39,455) 2016

TD Friends of the Environment Foundation *High Altitude Balloon Experiment Program* D. Gerhard and S. Cheng ($10,000) 2016

NSERC PromoScience *High Altitude Balloon Experiment Program.* D. Gerhard and S. Cheng ($10,500) 2014

President's Teaching and Learning Scholars Program *Development of an Instructional On-line Homework and Test System for Introductory Organic Chemistry.* D. Gerhard and R. S. Murphy ($5000) 2014

President's Teaching and Learning Scholars Program *Student Centred Self-Assessment for Computer-based Skills Development.* D. Gerhard and JT. Yang ($5000) 2014

CBC Ideas production grant *3d printing: the revolution will be extruded.* D. Gerhard ($75000 2013

President's Teaching and Learning Scholars Program *iPad orchestra. / Audio Production.* ($8000) 2012

Natural Sciences and Engineering Research Council Discovery Grant *Audio signal processing* ($17,000 per year) 2004-2007; 2007-2012

SSHRC General Research Grant Fund with J. Barden, R. Kell, and D. Malloy, Kinesiology ($5000) 2006

University of Regina Transdisciplinary Fund Competition B: Small Projects (3 awards, $2500 each) 2005

University of Regina Technology Enhanced Learning with D. Hepting ($32,000) 2005

Canadian Foundation for Innovation Ongoing New Opportunities Fund with D. Slezak ($59,655), 2004

Natural Sciences and Engineering Research Council Research Tools and Instruments with X.-D. Yang, D.H. Hepting, H. Hamilton and B. Yang ($44,594) 2004

Government of Canada Western Economic Diversification with X.-D. Yang, D.H. Hepting, and H. Hamilton ($97,000) 2004

Teaching Experience: Computer Science, University of Regina

(Complete teaching dossier and course evaluations available on request.)

For all courses I am the sole instructor (unless noted), often in charge of a teaching team consisting of lab instructors, teaching assistant/markers, and supplemental instruction facilitators.

Course	Number	Years taught	Notes
Core Courses			
Digital Systems Architecture	CS 301	2007, 2010–2020	§
Virtual Reality	CS 458	2020–2021	⋆‡ ↺390AP
Introduction to Digital Systems	CS 201	2008, 2010, 2016–2021	§
Programming & Problem Solving for Natural Sciences	CS 110	2009, 2011–2017	
Risk & Reward in the Information Society	CS 280	2007, 2011, 2018	⋆
The iPad Orchestra	CTCH 202	2012–2016	co-taught (3)
Advanced Hardware Architecture	CS 401	2016	§
Building Interactive Gadgets	CS 207	2011–2014	⋆
Software Development Project	CS 476	2011, 2012	
Introduction to Computer Audio	CS 327	2008, 2010	⋆‡ ↺490BX
Elements of Computer Hardware and Software	CS 250	2005–2007	→ CS 201
Human Computer Communications	CS 305	2005	→ CS 280
Computer Architecture	CS 400	2004, 2005, 2006	→ CS 301
Special Topics Courses			
Topics in Virtual Reality	CS 390AP	2019	⋆
Interactive Hardware	CS 490CV	2012, 2017	⋆‡
Scientific Visualization	CS 491AA	2016, 2017	
Parallel Computer Architecture	CS 490AD	2016	
Mobile Development	CS 490CW	2012, 2014	⋆
Social and Ethical Implcations of Computing	CS 490BF	2012	⋆
Theatre Technology	CS 290AI	2011	⋆
Computational Models in Music	CS 490CQ	2008	⋆
Topics in Societal and Ethical Considerations	CS 290AG	2006	⋆
Computer Audio Topics	CS 490BX	2004–2007, 2010–2014	⋆‡
Graduate Courses			
Virtual Reality	CS 858	2020–2021	⋆‡
Interactive Hardware	CS 890EH	2012, 2017	⋆‡
Interactive Hardware	CS 807	2013–2016	⋆ ↺890EH
Computer Audio	CS 827	2008, 2010, 2014	⋆‡ ↺890CG
Computer Audio Topics	CS 890CG	2004, 2007, 2011, 2014	⋆‡
Electronics for Interactivity	ART 820AH	2012	
Pattern Classification	CS 890DR	2008	
Pattern Recognition	CS 835	2004, 2006	

⋆ I created and developed this course
→ Course was replaced by an updated core course
↺ Reworking of a special topics course into a core course
§ I spearheaded the redevelopment of the computing hardware curriculum stream in 2010
‡ Graduate and Undergrad taught together

Research Contributions and Practical Applications

Signal Analysis using Periodicity applied to Sound, Motion, and Biometrics Low-level analytical techniques for information-rich human signals. Multi-pass adaptive frequency estimation for music [27, 38, 12]. Human motion including swimming [11] and running [9, 28]. As well as using Virtual Reality as data capture and interaction mode [17]. Currently being applied to trans-cranial doppler and Ballistocardiography. Swim Analytics won the 2018 Paragon Award of Innovation.

New Interfaces and Devices for Artistic Practice Human-computer interactions with creativity interfaces: development of new hardware [36], embedded [39], or virtual [21] instruments, and alternative musicological interfaces [20] and explorations into the nature of creativity [29]. Results from this work are also disseminated in commercial applications, artistic practice, and performance venues. The Rainboard won the 2014 Paragon Award of Innovation

In the publication venues listed below, contribution is indicated by author order, with the first author typically contributing the most to the work. Students have first authorship when they have done more than half the work. All citation counts are from Google Scholar (2021). 840 citations; H-index 12; i10-index 19.

Most Cited Contributions:
[**65**] Sole author, cited by 358; [**66**] Sole author, cited by 68; [**62**] Sole author, cited by 42; [**42**] Two authors, cited by 30; [**59**] Sole author, cited by 29; [**63**] Sole author, cited by 25; [**41**] Three authors, cited by 20; [**44**] Two authors, cited by 16;

Books

[**1**] D. Gerhard and W. Norton (to appear in 2022) Virtual Reality Usability Design. *Taylor Francis.*

Documentaries

[**2**] D. Gerhard (2013) The Revolution will be Extruded. *CBC Ideas* 1-hour radio documentary on the history and future of 3d printing. Multiple airings across Canada and around the world on Sirius and PRI.

Journals and Book Chapters

[**3**] Carleton, R. N., Krtzig, G. P., Sauer-Zavala, S., Neary, J. P., Lix, L. M., Fletcher, A. J., Afifi, T. O., Brunet, A., Martin, R., Hamelin, K. S., Teckchandani, T. A., Jamshidi, L., Gerhard, D., McCarron, M., Hoeber, O., Jones, N. A., Stewart, S. H., Keane, T. M., Sareen, J., Dobson, K., Asmundson, G. J. G. (in press). The Royal Canadian Mounted Police (RCMP) Study: Protocol for a Prospective Investigation of Mental Health Risk and Resiliency Factors. Health Promotion and Chronic Disease Prevention in Canada. August 2022 (Volume 42:8)

[**4**] M. Brahms, Y. Zhao, D. Gerhard, J. Barden. (2020) Long-range correlations and stride pattern variability in recreational and elite distance runners during a prolonged run. Gait and Posture. doi: 10.1016/j.gaitpost.2020.08.107

[**5**] S. Cheng , D. Gerhard, F. Gendron, and V. Ziffle. (2019) Incorporation of High-Altitude Balloon Experiment in High School Science Classrooms. Creative Education, 10, 262-272. doi: 10.4236/ce.2019.102021.

[**6**] S. Cheng, F. Gendron, V. Ziffle, and D. Gerhard, (2019) Engaging Indigenous Youth in Science with the High-Altitude Balloon Experiment. Creative Education, 10, 319-331. doi: 10.4236/ce.2019.102026.

[**7**] J. Desnoyers-Stewart, D. Gerhard, and M. Smith. (2019) Augmenting Virtuality with a Synchronized Dynamic Musical Instrument: A User Evaluation of a Mixed Reality MIDI Keyboard. Lecture Notes in Computer Science 11265: 540–557.

[**8**] J.Desnoyers-Stewart, D. Gerhard, M. Smith. (2018) Augmenting a MIDI Keyboard Using Virtual Interfaces. JAES Volume 66 Issue 6 pp. 439-447. doi: 10.17743/jaes.2018.0034

[**9**] M. Brahms, Y. Zhao, D. Gerhard, J. Barden. Stride length determination during overground running using a single foot-mounted inertial measurement unit (IMU). Journal of Biomechanics. Volume 71, 11 April 2018, 302–305. doi: 10.1016/j.jbiomech.2018.02.003

[**10**] J. Ubbens and D. Gerhard (2015). Information Rate for Fast Time-Domain Instrument Classification. Lecture Notes in Computer Science 9617: 297–308.

[**11**] Y. Zhao, D. Gerhard, J. Barden (2015). Periodicity-based swimming performance feature extraction and parameter estimation. Sports Engineering. 18: 177–189.

[**12**] Y. Zhao, D. Gerhard (2014) Waveform-Aligned Adaptive Windows for Spectral Component Tracking and Noise Rejection. Lecture Notes in Computer Science 8905: 463–480.

[**13**] D. Gerhard (2014) Three Degrees of "G"s: How an Airbag Deployment Sensor Transformed Video Games, Exercise, and Dance. MC Journal of media and culture. 12/2013; 16(6).

[**14**] D. Gerhard, X. Zhang (2010) Chord Analysis Using Ensemble Constraints. *In* Advances in Music Information Retrieval. Ras, Zbigniew W. & Wieczorkowska, Alicja (Eds.) ISBN 978-3-642-11673-5.

[**15**] D. Gerhard, B. Park, and J. Ellis (2008). Focus-Plus-Context Audio Interaction Design. Computer Music Modelling and Retrieval, Lecture Notes in Computer Science. 453–477.

Articles in Refereed Conferences

[**16**] W.Norton, P.Pitura, D. Gerhard (2022) Design and Implementation of a Chorded-Keyboard Mapping for Existing VR Hand Controllers. in Proceedings of the Future Technologies Conference (FTC) 2021, Volume 3.

[**17**] W. Norton, J. Sauer, and D. Gerhard. (2020) A Gait Analysis of a Virtual Reality Inverse Treadmill. in Proceedings of the Future Technologies Conference (FTC) 2020, Volume 2.

[**18**] G. Eromosele and D. Gerhard. (2020) Integrating a Traffic Preemption System on an Emergency Vehicle and Airport Runway System. 2020 IEEE 6th World Forum on Internet of Things (WF-IoT), New Orleans, 6 pages.

[**19**] W. Norton, J Sauer, and D. Gerhard. (2020) The Effectiveness of Virtual Reality as an Instructional Medium for Multidimensional Concepts. 6th International Conference of the Immersive Learning Research Network (iLRN)

[**20**] H. Hu and D. Gerhard (2019). Modelling 4-dimensional Tonal Pitch Spaces with Hopf Fibration. 14th International Symposium on Computer Music Multidisciplinary Research (CMMR), Marseille, France.

[**21**] J. Desnoyers-Stewart, D. Gerhard, and M. Smith. (2017) Mixed Reality MIDI Keyboard. In Proceedings of the 13th International Symposium on CMMR, Porto, Portugal, 11 pages.

[**22**] J. Desnoyers-Stewart, D. Gerhard, and M. Smith. (2017) Mixed Reality MIDI Keyboard Demonstration. In Proceedings of AM 17, London, United Kingdom, 2017, 5 pages.

[**23**] J. Barden, D. Gerhard, O. Vila Dieguez, J. Ubbens and B. Park (2017). The Effect of Breathing Asymmetry on Stroke Periodicity in Competitive Front-Crawl Swimming (poster). Own the Podium SPIN summit 2017.

[**24**] H. Hu and D. Gerhard (2017). Appropriate Isomorphic Layout Determination Using 3-D Helix Lattices. 43rd International Computer Music Conference, Shanghai. Pages 472-475.

[**25**] H. Hu and D. Gerhard (2016). WebHexIso: A Customizable Web-based Hexagonal Isomorphic Musical Keyboard Interface. 42nd International Computer Music Conference, Utrecht.

[**26**] H. Hu, B. Park and D. Gerhard (2015). Mapping Tone Helixes to Cylindrical Lattices using Chiral Angles. 41st International Computer Music Conference, Texas.

[**27**] Jordan Ubbens and David Gerhard (2015). Information Rate for Fast Time-Domain Instrument Classification. 11th Annual Conference on Computer Music Multidisciplinary Research.

[**28**] C. Brahms, Y. Zhao, J. Barden, D. Gerhard (2015). Concurrent Validity of a Foot-Mounted IMU to Estimate Stride Length in Running. 20th Annual Congress of the European College of Sport Science.

[29] Jason Cullimore and D. Gerhard (2015). The Virtuoso Composer and the Formidable Machine: A Path to Preserving Human Compositional Expression. 12th Sound and Music Computing Conference.

[30] Hanlin Hu, Brett Park, David Gerhard. (2015) On the Musical Opportunities of Cylindrical hexagonal Lattices: Mapping Flat Isomorphisms Onto Nanotube Structures. Sound and Music Computing. 12th Sound and Music Computing Conference.

[31] Hanlin Hu, Brett Park, D. Gerhard (2015). Mapping Tone Helixes to Cylindrical Lattices using Chiral Angles. 41st International Computer Music Conference.

[32] Yang Zhao, Markus Brahms, David Gerhard, John Barden (2015). Stance Phase Detection for Walking and Running using an IMU Periodicity-Based Approach. International Symposium on Computer Science in Sport (225-232). Springer

[33] Stephen Cheng and David Gerhard (2015). The National High Altitude Balloon Experiment: Engaging High School Students to do Citizen Science. 2nd International Conference on STEM Education and Innovation. Saskatoon.

[34] J. Cullimore, H. Hamilton, D. Gerhard (2014). Directed Transitional Composition for Gaming and Interactive Music Using Q-Learning. First joint ICMC/SMC conference.

[35] B. Park, D. Gerhard (2013) Discrete Isomorphic Completeness & a Unified Isomorphic Layout Format. *SMC13*.

[36] B. Park and D. Gerhard (2013) Rainboard and Musix: Building dynamic isomorphic interfaces. 13th International Conference on New Interfaces for Musical Expression.

[37] R. Caines, D. Gerhard, P. Minevich (2013) The University of Regina iPad Orchestra: Engaging mobile audiovisual technologies in music teaching and learning. *Teaching and Learning to the Power of Technology.*

[38] Y. Zhao and D. Gerhard. Improved Spectral Analysis Using Waveform-Aligned Adaptive Windows.*2013 Computer Music Modelling and Retrieval* Marseille.

[39] D. Gerhard, Brett Park (2012). Instant Instrument Anywhere: A Self-Contained Capacitive Synthesizer. *12th International Conference on New Interfaces for Musical Expression (NIME12)*, Ann Arbor, Michigan. 516–519.

[40] Nathan Magnus, D. Gerhard (2012). Musician Assistance and Score Distribution (MASD). *12th International Conference on New Interfaces for Musical Expression (NIME12)*, Ann Arbor. 184–187.

[41] Steven Maupin, D. Gerhard, Brett Park (2011). Isomorphic Tessellations for Musical Keyboards. *Proc. Sound & Music Computing Conference.* 2011, Padova, Italy. 471–478.

[42] Lijuan Peng and D. Gerhard (2009). A Wii-based Gestural Interface for Orchestral Conducting Education. *First Int. Conf. on Computer Supported Education (CSEDU)*, Lisbon. 406–409.

[43] Lijuan Peng and D. Gerhard (2009). A Wii-based gestural interface for computer conducting systems. *Ninth International Conference on New Interfaces for Musical Expression (NIME)*, Pittsburgh, PA. 155–158.

[44] Xinglin Zhang and D. Gerhard (2008). Chord Recognition using Instrument Voicing Constraints. *International Conf. Music Information Retrieval (ISMIR)*, Philadelphia, 33–38.

[45] Daryl Hepting , Lijuan Peng, Tim Maciag, D. Gerhard and Brien Maguire. (2008). Creating synergy between usability courses and open source software projects. ACM SIGCSE Bulletin. ACM Press. 120–123. (Reviewed Professional Magazine article)

[46] D. Gerhard and Ellen Moffat (2007). convocare_consonare: A Duet in Four Voices. *International Computer Music Conference*, Copenhagen. 477–484.

[47] D. Gerhard and Jarrod Ellis (2007). Focus-Plus-Context Displays for Audio Interaction. *International Conference on Computer Music*, Copenhagen. 405–412.

[**48**] Brien Beattie, Garrett Nicolai, D. Gerhard, Robert J. Hilderman (2007). Pattern Classification in No-Limit Poker: A Head-Start Evolutionary Approach. *Canadian Conference on AI*. 204–215.

[**49**] JJ Nixdorf and D. Gerhard (2006). RITZ: A real-time tool for interactive spatialization. Proc. ACM Multimedia, Santa Barbara, pp 687–690.

[**50**] JJ Nixdorf and D. Gerhard (2006). Real-time sound source spatialization as used in *challenging bodies*: implementation and performance. *International Conference on New Interfaces for Musical Expression (NIME06)*, Paris, 318–321.

[**51**] D. Gerhard and Daryl H. Hepting (2005). A framework for personalization of interactive sound synthesis. International Computer Music Conference, Barcelona, Spain.

[**52**] Daryl H. Hepting, D. Gerhard, Joel Rathgaber (2005). Realtime interactive multimedia performance. ACM SIGGRAPH 2005, Los Angeles, California.

[**53**] D. Gerhard (2005). Multiresolution pitch analysis of talking, singing, and the continuum between. Rough Sets, Fuzzy Sets, Data Mining and Granular Computing), Lecture Notes in Artificial Intelligence (LNAI) 3642, Vol II, pp 294–303.

[**54**] D. Gerhard (2005). Pitch track target deviation in natural singing. Sixth International Conference on Music Information Retrieval (ISMIR) Queen Mary, U. of London, pp 514–519.

[**55**] Lu Meng and D. Gerhard (2005). Acoustic ray tracing for 3D environment simulation. Proc. Canadian Acoustical Assoc Acoustics Week in Canada, London, Ontario.

[**56**] D. Gerhard, Daryl H. Hepting, M. Mckague. (2004). Exploration of the correspondence between visual and acoustic parameter spaces. International Conference on New Interfaces for Musical Expression, Hamamatsu, Japan.

[**57**] D. Gerhard and Daryl H. Hepting (2004). Cross-modal parametric composition. International Computer Music Conference (ICMC04), Miami, Florida, IEEE. 505–512.

[**58**] D. Gerhard and Daryl H. Hepting (2004). Triangularhythmic. Digital Jukebox, International Computer Music Conference (ICMC04), Miami, Florida, IEEE.

[**59**] D. Gerhard (2002). Pitch-based acoustic feature analysis for the discrimination of speech and monophonic singing. Canadian Acoustics 30 (3), 152-153.

[**60**] D. Gerhard (2002). A human vocal utterance corpus for perceptual and acoustic analysis of speech, singing and intermediate vocalizations (abstract). J. Acoustical Soc. of America, 112(5):2264.

[**61**] D. Gerhard (2002). Perceptual features for a fuzzy speech-song classification (abstract). International Conf. on Acoustics, Speech and Signal Processing, volume IV, page 4160.

[**62**] D. Gerhard (2000). Audio signal classification: an overview. *Canadian AI*, 45:4–6, Winter 2000.

[**63**] D. Gerhard. Audio visualization in phase space. In *Bridges: Mathematical Connections in Art, Music and Science*, pages 137–144, Aug. 1999.

[**64**] D. Gerhard. Automatic interval naming using relative pitch. In *Bridges: Mathematical Connections in Art, Music and Science*, pages 37–48, Aug. 1998.

Non-refereed contributions

[**65**] D. Gerhard (2003). Pitch extraction and fundamental frequency: history and current techniques. Technical Report TR 2003-05, Univ. of Regina Computer Science. (26 pages).

[**66**] D. Gerhard (2003). Audio signal classification: history and current techniques. Technical Report TR 2003-06, Univ. of Regina Computer Science. (22 pages).

[67] D. Gerhard (1997) Computer music analysis. Simon Fraser Univ. School of Comput. Sci. Tech. Rep. CMPT TR, 97-13.

Contributions to practical applications of knowledge

In 2010 I founded Shiverware Interactive Software Developments Inc. From 2010-2018 I was co-owner and Head of research and applied innovation. I and two colleagues started shiverware to bring interactive media research to market. Based on the work published in [41] we have created an iPhone/iPad application (Musix Pro) and made it available for purchase, showing a direct influence of this technology development on the economy of Canada. To date more than 35,000 individual copies of the software have been downloaded or purchased for a nominal fee, and more than 2000 people use Musix Pro at least once a week. Shiverware has a half-dozen apps on the store, and works directly with private companies to develop mobile technology solutions. www.shiverware.com

In 2012 I co-founded of CrashBang Labs Inc, a registered non-profit hackerspace/makerlab based in Regina, SK. CrashBang Labs serves to bring together artists and DIY technologists in the local community, to find ways of supporting the growing Maker movement. www.crashbanglabs.net

Other Evidence of Impact and Contributions

Participation in Community, Consulting Activities

- Board member: Sask Polytech Digital Integration Center of Excellence - Technology Access Center (DICE-TAC) 2019-2022
- External unit review: University of Windsor Computer Science Department (2020)
- emcee, UR Change Makers 2019
- UR Rep, Sask Tech Education K-12 working group, (2015-2018)
- Head of research and applied innovation: Shiverware Interactive Software Developments Inc. (2010–2018)
- Publicity Chair, 2013 AI / GI / CRV conference.
- CrashBang Labs, Inc. Executive Team. Vice President (2012), President (2013)
- Consultant: Interactive Exhibits: Government of Saskatchewan and Museums of Saskatchewan. 2012; Web: Canadian Council on Continuing Education in Pharmacy; Multimedia: Music/Theatre, “Eurydice,” (2011); “Landscapes of the Soul,” (2011); “DanceWorlds,” (2010); “Challenging Bodies,” (2006).
- Reviewer: the International Computer Music Conference (2004-current);the International Conference on New Interfaces for Musical Expression (2007-current), the International Conference on Music Information Retrieval (2005-current); the Computer Music Journal (2004-2008); Computational Statistics and Data Analysis (2006); Signal Image and Video Processing (2007); the Toronto Electroacoustic Symposium (2010-2012).
- Grant reviewer: NSERC Discovery Grants (2007, 2008); Strategic Projects (2010).
- Tutorials Chair, 2006 International Conference on Music Information Retrieval.

Presentations, Shows and Lectures

- Virtual Reality: Past failures, current hype and future vision. Science Pub Series (2019)
- Technology Education, University of Regina graduate teaching certificate. (2018)
- Computing and the Future of Everything. Invited Keynote speaker, STEMfest, Saskatoon, Canada. (2015)
- Space Balloons and Computer Science. Sciematics, Regina, Canada (2015)

- High Altitude Balloon Program, the Canada-Wide Experiment. Presentation to multiple groups including Science Rendezvous National and 4H National.
- 3D printing and modelling. Centre for Teaching and Learning Seminar, Regina, Canada. (2015)
- Creative Hacking. Regina Public Library Makerfaire (2014)
- Technology for the Classes. Centre for Teaching and Learning Invited Seminar (2014)
- Hacking and Meta-Creativity. Cognitive Informatics Invited Keynote (2013)
- The University of Regina iPad Orchestra. TLT 2013
- Rainboard: semi-finalist at the Guthman musical instrument competition, (2012)
- TEDx talk on interactive musical instruments (https://youtu.be/r3kocjx69g4) (2012)
- Panel discussion on the future of telecom tech in Saskatchewan at the Sask3.0 summit (2012)
- Invited lectures on the Maker revolution and Arduino (2011-2012).
- The DIY robo-revolution. Science Pub series (2011).

Public Awareness and Education

- Nationally syndicated technology columnist (CBC, Paid. 2006–current). more than 400 media events, including more than 80 nationally syndicated radio columns; Radio, TV, Web, Print
- Organizer and regular presenter, "Science Rendezvous,"
- Research work featured in "Innovation Nation" TV show in 2010.
- Lectures and Workshops to schools, businesses, and non-profit organizations, including Canadian Information Processing Society, Lieutenant Governor's leadership forum, and Science Camps.

Service and Administration

- Information Services Technology advisory panel
- University e-proctoring advisory committee
- Computer Science committees: Curriculum, External Relations, Publicity, Co-Op, Seminars, Honours.
- University of Regina AVP hiring committee (2019)
- Student Appeals Committee, Faculty of Science (2007–2019, Chair for 2013–2019)
- Chair, Computer Science Search Committee; 2-year term lecturer (2019); MHIM (2018)
- Dean's Rep, Faculty of Science search committee: Geology (2011), Biology (2011), Geology (2018)
- Dean's Rep, Faculty of Fine Arts search committee: C-Tech (2010); Conducting (2012); Voice (2013)
- Science Rep, Teaching and Learning Advisory Committee (TLAG) (2013–2017)
- Judge, Regina Regional Science Fair (2003–current); Canada-Wide Science Fair (2017)
- Faculty Review committee, Faculty of Science (2010–2012, Chair for 2012)
- Faculty of Fine Arts Steering committee: Creative Technologies degree program (2010–2018)
- Branding Advisory Committee, University of Regina (2009–2010)
- Executive of Council, University of Regina (2006–2007)

Training of Highly Qualified Personnel

Supervised Student	Program	Status	Date	Notes
Devon Blewett	MSc	Current	2021	
Phil Pitura	MSc	Current	2020	
Dami Egbeyemi	MSc	Current	2019	Interdisciplinary
Hanlin Hu	PhD	Current	2016	part time
Jason Cullimore	PhD	Completed	2013-2019	Interdis., co-supervised with R. Caines (MAP)
Mikhail Shchukin	MSc	Completed	2019-2020	
Gideon Eromosele	MSc	Completed	2019-2020	Project
John Desnoyers-Stewart	MSc	Completed	2016-2018	Interdis., co-supervised with M. Smith (MAP)
Jordan Ubbens	MSc	Completed	2012–2015	in PhD program
Hanlin Hu	MSc	Completed	2013–2015	in PhD program
Yang Zhao	PhD	Completed	2010–2015	Employed in Industry
Joel Rathgaber	MSc	Completed	2006–2012	Employed in Industry
Robert Bailey	MSc	Completed	2007-2011	Co-Supervised with Howard Hamilton
Hao Li	MSc	Completed	2007–2009	Employed in Industry
Xinglin Zhang	MSc	Completed	2007–2010	Employed in Industry
LiJuan Peng	MSc	Completed	2006–2008	
JJ Nixdorf	MSc	Completed	2004–2009	Employed at EA games BC
Zakhar Kanyuka	BSc	Completed	2019	Virtual Reality; medicine
Maria Azam	BSc	Completed	2019	Virtual Reality
Wil Norton	BSc	Completed	2018	Virtual Reality (NSERC USRA)
Jacob Sauer	BSc	Completed	2018	Virtual Reality (NSERC USRA)
Oles Shnurovskyy	BSc	Completed	2017	Augmented Reality
Brian Hewitt	BSc	Completed	2016	High Altitude Balloon Project
James Spaleta	BSc	Completed	2016	High Altitude Balloon Project
Laura Teigrob	BSc	Completed	2016	High Altitude Balloon Project
Riley Reid	BSc	Completed	2015	Mobile App Development
Landon Rohatensky	BSc	Completed	2015	Mobile App Development
Kale Baiton	BSc	Completed	2015	Mobile App Development
Regan Meloche	BSc	Completed	2015	3d printing for rapid prototyping
Mhmoud Essalah	BSc	Completed	2014	High Altitude Balloon Project
Thomas Ogilvie	BSc	Completed	2014	High Altitude Balloon Project
Eden Rohatensky	BSc	Completed	2013	Mobile Technology
Joel Kreutzwieser	BSc	Completed	2012	Autonomous quadcopter
Jordan Ubbens	BSc	Completed	2012	iPhone psychology testing
Ryan Brown	BSc	Completed	2012	Real-time harp-controlled fractal
Stephanie Kos	BSc	Completed	2012	Copyright law and user-generated content
Ryan MacDougall	BSc	Completed	2012	Video game control using acoustic features
Nathan Magnus	BSc	Completed	2011	Musician Assistance and Score Distribution
Natasha Jaques	BSc	Completed	2011	Kinect music (NSERC USRA)
Tim Sample	BSc	Completed	2011	Analysis of Choral Music
Steve Maupin	BSc	Completed	2011	Isomorphic Tessellations
Robin Jastrzebski	BSc	Completed	2011	Analysis of accelerometer data
Colton Fink	BSc	Completed	2010	Arduino light and sound
Peter Dowdy	BSc	Completed	2010	Projections for Eurydice
Jed Hubic	BSc	Completed	2010	
Larry Yang	BSc	Completed	2010	NSERC USRA
Matt Haines	BSc	Completed	2010	
Colan Lash	BSc	Completed	2008	NSERC USRA
Jennifer Allen	BSc	Completed	2007	NSERC USRA, co-sup J. Barden
Mark Cazakoff	BSc	Completed	2006	
Jarrod Ellis	BSc	Completed	2006	

Jeremy Hinks	BSc	Completed	2005	summer employment student
Ryan Hill	BSc	Completed	2005	Current local electronic musicician

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  - Daniel Fleischhaker, MSc, 2019 (University of Regina, Mathematics, External Examiner)
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  - Rasem Suwan, MSc, 2008 (University of Regina, Computer Science, I/E)
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  - Trevor Tomesh, PhD, 2019 (Computer Science)
  - Amanda Hawkins, MSc, 2019 (Computer Science)
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  - Mustakim Al Helal, MSc, 2018 (Computer Science)
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  - Jesse Goddard, MFA, 2018 (Visual Art)
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