THE UNIVERSITY OF BRITISH COLUMBIA
Curriculum Vitae for Faculty Members

Date: May 1, 2022 **Initials**:

1. **SURNAME**: Lawrence **FIRST NAME**: Ramon
MIDDLE NAME(S): Edward

2. **DEPARTMENT/SCHOOL:** Department of Computer Science, Mathematics, Physics, and Statistics

3. **FACULTY**: Irving K. Barber Faculty of Science, UBC Okanagan

4. **PRESENT RANK**: Professor **SINCE**: July 2019

5. **POST-SECONDARY EDUCATION**

University	Degree	Subject Area	Dates
University of Manitoba	Ph.D.	Computer Science	1996 - 2001
University of Manitoba	B.C.Sc. (Honours)	Computer Science	1993 - 1996

Ph.D. Thesis: "Automatic Conflict Resolution to Integrate Relational Schema"
Supervisor: Ken Barker

6. **EMPLOYMENT RECORD**

(a) Prior to coming to UBC

University	Rank or Title	Dates
University of Iowa	Assistant Professor	Sept 2001 – July 2006
University of Manitoba	Summer Instructor	May 2001 – July 2001

(b) At UBC

Rank or Title	Dates
Professor (Computer Science)	July 2019 –
Associate Professor (Computer Science)	July 2010 – June 2019
Assistant Professor (Computer Science)	Aug 2006 – June 2010

(c) Date of granting of tenure at UBC: July 2010

7. **LEAVES OF ABSENCE**

Location	Type of Leave	Dates
UBC	Sabbatical	Jan 2021 – Dec 2021
General Electric (Software Research Centre)	Sabbatical	Jan 2014 – Dec 2014

8. **TEACHING**

(a) Areas of special interest and accomplishments

I am passionate about student learning and success. This dedication is recognized by being a 9-time member of the UBC Okanagan Teaching Honour Roll (top 10% faculty), the recipient of the Provost Award for Teaching Excellence and Innovation in 2017, and the Killam Teaching Award in 2020. I have been funded to develop technology systems to improve education including an IKBSAS Curricular Innovation award and ALT-2040 funding in 2020 to develop virtual labs for computer science courses. The work on "Competitive Gaming" (highly cited IEEE paper) was nominated in two successive years for the President's Instructional Technology Innovation Award (highest innovation in teaching award at the University of Iowa). I am a catalyst for curriculum innovation having co-developed the BA in Computer Science, including two courses for Arts students (COSC 122 and 123), and created the data analytics course (DATA 301). These are some of the most popular and highest enrolment courses in Computer Science. I was the first Director of the Master of Data Science program on the Okanagan campus and led its development and success as an exemplar professional program.

(b) Courses Taught at UBC

My standard teaching load at UBC Okanagan is currently 3 courses per academic year, although prior to 2013 it was 4 courses per year. Graduate and directed studies courses do not count towards this workload. All undergraduate courses have labs. Although I may have a TA for marking the lab, I prepare all labs and assignments.

Session	Course Number	Sched. Hours	Class Size	Hours Taught			
				Lectures	Tutorials	Labs	Other
W21 T1	COSC 448 (Dir Studies)	3	1				3
W21 T2	COSC 404/504 (DB Sys)	3	99 / 1	3			
S21 T1-2	COSC 516A (Topics DB)	3	4				3
W21 T1-2	COSC 449 (Hon Thesis)	3	3				3
W20 T1	COSC 304 (Intro DB)	3	180	3			
W20 T1	COSC 448 (Dir Studies)	3	1				3
W20 T1	COSC 548 (Dir Studies)	3	1				3
W20 T1-2	COSC 449 (Hon Thesis)	3	2				3
W19 T2	DATA 301/501 (Data Analy) (fill in during last month)	3	145	1			1
W19 T2	COSC 448 (Dir Studies)	3	3				3
W19 T1-2	COSC 449 (Hon Thesis)	3	4				3
W19 T1	COSC 304 (Intro DB)	3	197	3			
W19 T1	COSC 448 (Dir Studies)	3	1				3
W19 T1	COSC 504 (DB Sys)	3	6				3
W19 T1	DATA 530 (Platforms)	1	35	1			
W19 T1	DATA 531 (Programming)	1	35	1			
W19 T1	DATA 540 (Databases)	1	35	1			
W18 T2	COSC 448 (Dir Studies)	3	1				3
W18 T1-2	COSC 449 (Hon Thesis)	3	4				3
W18 T1	COSC 304 (Intro DB)	3	113	3			
W18 T1	DATA 530 (Platforms)	1	28	1			
W18 T1	DATA 531 (Programming)	1	28	1			
W18 T1	DATA 540 (Databases)	1	28	1			
W17 T2	DATA 301/501 (Data Analy)	3	151 / 15	3			
W17 T2	COSC 404/504 (DB Sys)	3	55 / 2	3			
W17 T2	COSC 448 (Dir Studies)	3	3				3
W17 T1	COSC 304 (Intro DB)	3	85	3			
W17 T1	COSC 448 (Dir Studies)	3	3				3

Session	Course Number	Sched. Hours	Class Size	Hours Taught			
				Lectures	Tutorials	Labs	Other
W17 T1-2	COSC 449 (Hon Thesis)	3	2				3
S16 T1-2	COSC 499 (Capstone)	3	13				3
S16 T1-2	COSC 448 (Dir Studies)	3	2				3
W16 T2	DATA 301/501 (Data Analy)	3	71 / 8	3			
W16 T2	COSC 448 (Dir Studies)	3	1				3
W16 T1	DATA 301/501 (Data Analy)	3	83 / 9	3			
W16 T1	COSC 304 (Intro DB)	3	86	3			
W16 T1	COSC 447 (Dir Studies)	3	1				3
W16 T1-2	COSC 449 (Hon Thesis)	3	3				3
W15 T2	DATA 301/501 (Data Analy)	3	68 / 2	3			
W15 T2	COSC 404/504 (DB Sys)	3	49 / 1	3			
W15 T1	COSC 448 (Dir Studies)	3	1				3
W15 T1	COSC 304 (Intro DB)	3	63	3			
W15 T1	COSC 447 (Dir Studies)	3	1				3
W15 T1-2	COSC 449 (Hon. Thesis)	3	5				3
W14 T2	COSC 448 (Dir Studies)	3	2				3
W14 T2	COSC 404/504 (DB Sys)	3	38	3			
W14 T1	COSC 448 (Dir Studies)	3	1				3
W14 T1	IGS 520C (Data Sci)	3	1				3
S14 T1-2	COSC 448 (Dir Studies)	3	2				3
W13 T1	COSC 122 (Comp Fluency)	3	111	3			
W13 T1	COSC 304 (Intro DB)	3	27	3			
W13 T1	COSC 448 (Dir Studies)	3	1				3
W13 T1	IGS 509T (User Eval)	3	1				3
W13 T1	IGS 509U (Rec Sys)	3	1				3
W13 T1-2	COSC 449 (Hon Thesis)	3	1				3
W12 T2	IGS 520K (Mobile Prog)	3	1				3
W12 T2	COSC 123 (Comp Create)	3	32	3			
W12 T2	COSC 416/IGS 520 (NoSQL)	3	17 / 5	3			
W12 T1	IGS 520A (Adv HCI)	3	1				3
W12 T1	IGS 509K (Mobile Inter)	3	1				3
W12 T1	COSC 448 (Dir Studies)	3	1				3
W12 T1	COSC 304 (Intro DB)	3	14	3			
W12 T1	COSC 122 (Comp Fluency)	3	94	3			
W12 T1-2	COSC 449 (Hon Thesis)	3	6				3
S11 T1-2	COSC 448 (Dir Studies)	3	2				3
W11 T2	IGS 520W (GPU)	3	1				3
W11 T2	COSC 123 (Comp Create)	3	37	3			
W11 T2	COSC 404/504 (DB Sys)	3	17 /1	3			
W11 T1	COSC 448 (Dir Studies)	3	1				3
W11 T1	COSC 304 (Intro DB)	3	19	3			
W11 T1	COSC 122 (Comp Fluency)	3	101	3			
W11 T1-2	COSC 449 (Hon Thesis)	3	3				3
W10 T2	IGS 520U/620N (GPU)	3	4				3
W10 T2	IGS 620A (Data Agg)	3	1				3
W10 T2	IGS 520L/620L (Sensor DB)	3	2				3
W10 T2	COSC 416 (Spec DB)	3	16	3			
W10 T2	COSC 123 (Intro CS)	3	34	3			
W10 T1	IGS 620B (Educ Sys)	3	1				3
W10 T1	IGS 520H (Embed Sys)	3	1				3

Session	Course Number	Sched. Hours	Class Size	Hours Taught			
				Lectures	Tutorials	Labs	Other
W10 T1	COSC 304 (Intro DB)	3	11	3			
W10 T1	COSC 122 (Comp Fluency)	3	98	3			
W10 T1	COSC 448 (Dir Studies)	3	1				3
W10 T1-2	COSC 449 (Hon Thesis)	3	2				3
W09 T2	IGS 501K (GPU)	3	1				3
W09 T2	COSC 448 (Dir Studies)	3	2				3
W09 T2	COSC 404/504 (DB Sys)	3	13 /3	3		2	
W09 T2	COSC 123 (Intro CS)	3	27	3			
W09 T1	IGS 520E (Dist DB)	3	1				3
W09 T1	IGS 501U (Sensor Net)	3	2				3
W09 T1	COSC 122 (Comp Fluency)	3	68	3			
W09 T1	COSC 304 (Intro DB)	3	9	3			
W09 T1-2	COSC 449 (Hon Thesis)	3	1				3
S08 T1-2	COSC 448 (Dir Studies)	3	1				3
W08 T2	COSC 448 (Dir Studies)	3	1				3
W08 T2	IGS 520W (Web Servers)	3	2				3
W08 T2	IGS 520O (GIS)	3	1				3
W08 T2	IGS 520D (Advanced DB)	3	1				3
W08 T2	IGS 520A (Net Route)	3	1				3
W08 T2	IGS 501U (Sensor Net)	3	1				3
W08 T2	COSC 123 (Intro CS)	3	19	3			
W08 T1	IGS 520J (DB Alg)	3	1				3
W08 T1	IGS 520E (Dist DB)	3	1				3
W08 T1	COSC 122 (Comp Society)	3	46	3			
W08 T1	COSC 310 (Soft Eng)	3	10	3		2	
W08 T1	COSC 304 (Intro DB)	3	9	3		2	
W08 T1-2	COSC 449 (Hon Thesis)	3	1				3
W07 T2	IGS 520J (DB Alg)	3	2				3
W07 T2	IGS 520D (Adv DB)	3	1				3
W07 T2	IGS 501U (Sensor Net)	3	3				3
W07 T2	COSC 404 (DB Sys)	3	20	3		2	
W07 T2	COSC 122 (Comp Society)	3	34	3			
W07 T1	IGS 520E (Dist DB)	3	1				3
W07 T1	IGS 501U (Sensor Net)	3	3				3
W07 T1	COSC 304 (Intro DB)	3	11	3		2	
W07 T1	COSC 310 (Soft Eng)	3	11	3		2	
W06 T2	COSC 328 (Networks)	3	21	3		2	
W06 T2	COSC 122 (Comp Society)	3	37	3			
W06 T1	COSC 304 (Intro DB)	3	14	3		2	
W06 T1	COSC 448 (Dir Studies)	3	1				3
W06 T1	COSC 310 (Soft Eng)	3	14	3		2	

(c) Students Supervised

Graduate Students

Student Name	Program Type	Year		Role	Notes
		Start	Finish		
Jonathan Gresl	M.Sc. (CS)	Sept 2021		supervisor	
Kyle Ranslam	M.Sc. (CS)	Jan 2021		supervisor	
David Ding	M.Sc. (CS)	Sept 2020		supervisor	

Devon MacNeil	M.Sc. (CS)	Sept 2020		supervisor	
Debangsha Sarkar	M.Sc. (CS)	Sept 2019	Dec 2021	co-supervisor	
Sarah Foss	M.Sc. (CS)	Sept 2019		supervisor	Prof at Okangan College
Nadir Ould-Khessal	Ph.D. (CS)	Sept 2017		supervisor	4 pubs, Prof at Okangan College
Matthew Fritter	M.Sc. (CS)	Sept 2017	July 2020	supervisor	2 pubs, Prof at Okangan College
Troy McMillian	Ph.D. (Eng.)	Sept 2017	Sept 2019	committee	On committee for 2 years
Heath Caswell	M.Sc. (CS)	Sept 2015	Sept 2018	supervisor	Withdrew
Scott Fazackerley	Ph.D. (IGS)	Sept 2010	Sept 2016	supervisor	8 pubs, NSERC PGS D, Prof at Okanagan College
Giuseppe Burtini	M.Sc. (IGS)	Sept 2013	Oct 2015	supervisor	3 pubs
Jamie McKee-Scott	M.Sc. (IGS)	Sept 2013	Apr 2015	committee	
Ryan Trenholm	M.Sc. (IGS)	Sept 2012	Dec 2014	supervisor	1 pub, NSERC CGS M
Ska-Hiish Manuel	Dir Study	May 2012	Aug 2012	supervisor	Soil moisture sensor
Stephen Smithbower	Dir Study	Jan 2012	Apr 2002	supervisor	3rd place IKBSAS URC
Tyler Cossentine	M.Sc. (IGS)	Sept 2009	Feb 2012	supervisor	2 pubs
Scott Fazackerley	M.Sc. (IGS)	Sept 2008	Apr 2010	supervisor	1 pub, NSERC CGS M
Salma Kheiravar	M.Sc. (IGS)	Sept 2012	Nov 2013	committee	
Michael Henderson	M.Sc. (IGS)	Sept 2008	May 2013	supervisor	2 pubs, NSERC CGS M
Bryce Cutt	M.Sc. (IGS)	Sept 2007	Mar 2009	supervisor	4 pubs, PostgreSQL patch
Terrence Mason	Ph.D. (Iowa)	Sept 2002	May 2006	supervisor	4 pubs, Assoc. prof. at Univ. of Wisconsin-Stout
Yan Wang	MCS (Iowa)	Aug 2005	Dec 2005	supervisor	UnityJDBC
Chadwick Johnson	MCS (Iowa)	Jan 2005	May 2005	supervisor	
Eduard Dragut	Ph.D. (Iowa)	Sept 2003	Transfer	supervisor	3 pubs, transfer to U. Chicago. in 2004, Assoc. prof. at Temple
Smitha Nair	MCS (Iowa)	Jan 2004	May 2004	supervisor	
Jeff Hoft	MCS (Iowa)	Aug 2003	Dec 2003	supervisor	UnityJDBC
Hehuang Xie	MCS (Iowa)	Jan 2003	May 2003	supervisor	
Min Wang	MCS (Iowa)	Jan 2003	May 2003	supervisor	
Jian Jia	MCS (Iowa)	Aug 2002	Dec 2002	supervisor	US Army research grant
Alina Bejan	Dir Study	Jan 2002	May 2002	supervisor	1 pub

Undergraduate Students

Student Name	Program Type	Year		Supervisor Role	Notes
		Start	Finish		
Ivan Carvalho	Honours	Sept 2021	Apr 2022	supervisor	Learned sorting
Emily Medema	Honours	Sept 2021	Apr 2022	supervisor	Dairy data analysis ; MSc. at Queen's (Vector scholarship)
Tatiana Urazova	Honours	Sept 2021	Apr 2022	supervisor	AutoEd system ; 1 pub
Jaden Balogh	Dir Study	Sept 2021	Dec 2021	supervisor	Unity game inventory database
Brandon Unger	Dir Study	Sept 2020	Dec 2020	supervisor	Online teaching system
Liam Tarr	Honours	Sept 2020	Apr 2021	supervisor	Online teaching system
Matthew Currie	Honours	Sept 2020	Apr 2021	supervisor	DADP record matching ; 1 pub
Matthew Currie	IKBSAS URA	May 2020	Aug 2020	supervisor	DADP record matching
Jonathan Gresl	Honours	May 2020	Aug 2020	supervisor	Built wireless sensor network ; 2 publications
Liam Tarr	Dir Study	Jan 2020	Apr 2020	supervisor	Built website for WCSA
Meredith Lister	Dir Study	Jan 2020	Apr 2020	supervisor	Develop softball video streaming
Eloise Espel	Dir Study	Jan 2020	Apr 2020	supervisor	Intern at Microsoft

Student Name	Program Type	Year		Supervisor Role	Notes
		Start	Finish		
Marlie Russell	Dir Study	Sept 2019	Dec 2019	supervisor	Built a web site for non-profit
Yuhao Huang	Honours	Sept 2019	Apr 2020	supervisor	Worked with BC Cancer
Ethan Godden	Honours	Sept 2019	Apr 2020	supervisor	Developed sensor code
Michael Sheroubi	Honours	Sept 2019	Apr 2020	supervisor	Investigated Neo4J
Puck Wang	Honours	Sept 2019	Apr 2020	supervisor	Developing teaching technology
Jonathan Gresl	NSERC USRA	May 2019	Sept 2019	supervisor	Built wireless sensor network
Joseph Pruner	Dir Study	Jan 2019	Apr 2019	supervisor	Developed teaching software
Andrew Feltham	Honours	Sept 2018	Apr 2019	supervisor	Linear hashing ; 2 pubs
Riley Jackson	Honours	Sept 2018	Apr 2019	supervisor	External sorting ; 2 pubs
David Osemwegie	Honours	Sept 2018	Apr 2019	supervisor	Web/mobile development
Joseph Pruner	Honours	Sept 2018	Apr 2019	supervisor	Softball BC site
Dana Klamut	Honours	Sept 2017	Apr 2018	supervisor	1 pub, Unit 5 Graduating Student of Year for 2018, Pushor Mitchell Gold Medal Leadership Prize
Kyla Reid	Honours	Sept 2017	Apr 2018	supervisor	IoT DB
Lawrence Fritzler	Dir Study	Jan 2018	Apr 2018	supervisor	Data analytics
Ryan McQueen	Dir Study	Jan 2018	Apr 2018	supervisor	Traffic monitoring
David Osemwegie	Dir Study	Jan 2018	Apr 2018	supervisor	Web development
James McDonnell	Dir Study	Sept 2017	Dec 2017	supervisor	Embedded DB
Lawrence Fritzler	Dir Study	Sept 2017	Dec 2017	supervisor	Embedded DB
Dustin Olychuck	Dir Study	Sept 2017	Dec 2017	supervisor	DB Sys
Maria Guenter	NSERC USRA	May 2017	Sept 2017	supervisor	Data fusion
Eric Huang	Honours	Sept 2016	Apr 2017	supervisor	Top CS graduating student for 2017, founder of BlockCAT
Spencer MacBeth	Honours	Sept 2016	Apr 2017	supervisor	Linear hash, 1 pub
Shan Rajapakshe	Honours	Sept 2016	Apr 2017	supervisor	Clinical NLP, UBCV MSc
Eric Huang	Dir Study	Jan 2017	Apr 2017	supervisor	2 pubs, IonDB
Dana Klamut	Dir Study	Jan 2017	Apr 2017	supervisor	1 pub, IonDB
Robert Hill	Dir Study	Jan 2017	Apr 2017	supervisor	Education system
Ashan Semasinghe	Dir Study	Jan 2017	Apr 2017	supervisor	Education system
Gurpreet Nijjar	Dir Study	Jan 2017	Apr 2017	supervisor	Web development
Dana Klamut	NSERC USRA	May 2016	Sept 2016	supervisor	IoT DB
Eliana Wardle	NSERC USRA	May 2016	Sept 2016	supervisor	JDBC caching drivers
Jorge Garcia	Dir Study	May 2016	July 2016	supervisor	Web development
Amritpal Shokar	Dir Study	May 2016	July 2016	supervisor	Web development
Kevin Eger	Honours	Sept 2015	Apr 2016	supervisor	Reddit, First job at Microsoft
Emily Millard	Honours	Sept 2015	Apr 2016	supervisor	Civic GIS
Wade Penson	Honours	Sept 2015	Apr 2016	supervisor	3 pubs, TEFS, runner up for Top CS graduating student for 2017
Kenny Raharjo	Honours	Sept 2015	Apr 2016	supervisor	1 pub, Game bandits
Ethan Willoner	Honours	Sept 2015	Apr 2016	supervisor	GPU encryption
Shayne Krogfoss	Dir Study	Sept 2015	Dec 2015	supervisor	Data analytics
Jamie Schofield	Dir Study	Sept 2015	Dec 2015	supervisor	Access student
Wade Penson	NSERC USRA	May 2015	Aug 2015	supervisor	Embedded DB
Wilco Oberholzer	Dir Study	May 2015	Aug 2015	supervisor	Web development
Alex Yakovlev	Dir Study	Jan 2015	Apr 2015	supervisor	Web development
Madison Cunning	Dir Study	Jan 2015	Apr 2015	supervisor	Métis database

Student Name	Program Type	Year Start	Year Finish	Supervisor Role	Notes
Tim Rutherford	Dir Study	Sept 2014	Dec 2014	supervisor	Web development
Raffi Kudlac	Dir Study	May 2014	Aug 2014	supervisor	1 pub, Arduino
Graeme Douglas	Honours	Sept 2013	Apr 2014	supervisor	1 pub, offer to UC Berkeley
Graeme Douglas	NSERC USRA	May 2013	Aug 2013	supervisor	LittleD
Derrick Pelletier	Honours	Sept 2012	Apr 2013	supervisor	Web development
Paul Moore	Honours	Sept 2012	Apr 2013	supervisor	iPhone app
Cody Clerke	Honours	Sept 2012	Apr 2013	supervisor	Parks management
William Lee	Honours	Sept 2012	Apr 2013	supervisor	2 pubs, game path finding
Andrew Moldovan	Honours	Sept 2012	Apr 2013	supervisor	AutoEdu, First job at Microsoft
Eric Wein	Honours	Sept 2012	Apr 2013	supervisor	AutoEdu
Graeme Douglas	Dir Study	Sept 2012	Dec 2012	supervisor	LittleD, URA winner in 2012
Derrick Pelletier	Dir Study	May 2012	Aug 2012	supervisor	Web development
William Lee	Dir Study	May 2012	Aug 2012	supervisor	DB parsing
Graeme Douglas	IKBSAS URA	May 2012	Aug 2012	supervisor	Embedded DB
Ryan Trenholm	NSERC USRA	May 2012	Aug 2012	supervisor	Water use systems
Andrew Campbell	Honours	Sept 2011	Apr 2012	supervisor	Sensor networks
Ryan Trenholm	Honours	Sept 2011	Apr 2012	supervisor	1 pub, Multi-disciplinary Undergraduate Research Conf Top 3 Presentation, Top Oral Presenter award at Universitas 21 (U21) International Undergrad Research Conference
Jessica Weeres	Honours	Sept 2011	Apr 2012	supervisor	UnityJDBC
Ryan Trenholm	IKBSAS URA	May 2011	Aug 2011	supervisor	Water use systems
Alyosha Pushak	Honours	Sept 2010	Apr 2011	supervisor	1 pub, teaching grant, USRA
Jessie Slamka	Honours	Sept 2010	Apr 2011	supervisor	Game visualizations
Brant Hardy	Dir Study	May 2011	Dec 2011	supervisor	Web development
Stephen Smithbower	Dir Study	Sept 2010	Dec 2010	supervisor	Rendering
Alyosha Pushak	NSERC USRA	May 2010	Aug 2010	supervisor	Sensor data
Geoffrey Appleby	Honours	Sept 2009	Apr 2010	supervisor	Best CS Thesis 2010
Stephen Smithbower	Dir Study	Jan 2010	Apr 2010	supervisor	1st place presentation at UBCO IKBSAS Undergrad Conference
Jessica Weeres	Dir Study	Jan 2010	Apr 2010	supervisor	UnityJDBC
Jacob Orr	Honours	Sept 2008	Apr 2009	supervisor	3rd place at Undergrad Research Conference
Tyler Cossentine	Dir Study	Jan 2009	Apr 2009	supervisor	Went on to MSc
Scott Fazackerley	NSERC USRA	May 2008	Aug 2008	supervisor	Sensor networks
Jocelyn Charland	Dir Study	Aug 2006	Dec 2006	supervisor	
Timothy Montoya	Honours	May 2003	May 2004	supervisor	Iowa
Elizabeth Heithoff	Honours	May 2002	May 2003	supervisor	1 pub, Iowa
Jose Jimenez	Honours	Jan 2002	Dec 2002	supervisor	Research grant, Iowa

(e) Continuing Education Activities

- Google IT Support Professional Certificate (Coursera – 5 courses – 2021)
- IBM Data Analyst Professional Certificate (Coursera – 8 courses – 2021)
    - Online certification badges: https://www.youracclaim.com/users/ramon-lawrence

- Google Project Management Professional Certificate (Coursera – 6 courses – 2021)

(f) Visiting Lecturer (indicate university/organization and dates)
(g) Other

9. SCHOLARLY AND PROFESSIONAL ACTIVITIES

(a) Areas of special interest and accomplishments

My primary contribution is in database system algorithms and performance. My research group has built a SQL, relational database system for embedded devices called LittleD and a key-value store library for Arduino called IonDB. Other contributions included Early Hash Join (VLDB) and the skew-handling histojoin (Information Systems) that has been implemented in PostgreSQL since version 8.4. My broader contributions are on the application of database technology to data analysis including the Digital Archive Database Project for historical Métis records (https://dadp.ok.ubc.ca), the construction of the NEXRAD weather data archive, and the use of sensor networks for irrigation management and water conservation. My research on database integration led to the implementation of JDBC drivers for database integration and virtualization including JDBC drivers for MongoDB, Splunk, and ServiceNow which have been used by thousands of users (including Apple, GE, Bank of America) and supported as commercial products by Unity Data Inc. (https://unityjdbc.com).

(b) Research or equivalent grants

Granting Agency	Project Title	Amount	COMP	Period		PI	Co-PIs
				Start	End		
NSERC Discovery	Embedded Databases for Agricultural and Environmental Applications	$120,000	C	May 2022	May 2027	Lawrence	
UBC ALT-2040	Expanding the Open Problem Bank with more problems, rich feedback, and support for Data Science	$25,000	C	May 2022	May 2023	Moosvi	Vrbik, Bobowski, Lawrence
UBC IKBSAS Curricular Innovation	Designing Virtual Labs for Improved Student Engagement and Success	$15,000	C	May 2020	May 2021	Lawrence	
UBC ALT-2040	On Demand Student Support with Virtual Labs and Help Desk	$25,000	C	May 2020	May 2022	Lawrence	Hui, Mohamed
Aboriginal Affairs and Northern Develop Canada (AANDC)	Digital Archive Database (DAD) Project (Phase 3)	$597,734	C	Mar 2019	Mar 2022	St. Onge (Ottawa)	Lawrence, M. Evans, J. Corbett
NSERC SPG	Determining optimal wildflower patch arrangements to maximize pollination services by wild bees in cultivated blueberry	$361,995	C	Nov 2017	Nov 2019	Tyson	Lawrence + 4 others
NSERC Discovery	Embedded Databases for the Internet of Things	$100,000	C	May 2017	May 2022	Lawrence	
AANDC	Digital Archive Database (DAD) Project (Phase 2)	$112,700	C	Sept 2015	May 2017	Lawrence	M. Evans + 2 others
AANDC	Digital Archive Database (DAD) Project	$35,000	C	Sept 2015	May 2016	M. Evans	Lawrence + 2 others

Granting Agency	Project Title	Amount	COMP	Period		PI	Co-PIs
				Start	End		
NSERC Discovery	Efficient Data Management for Tiny Embedded Devices	$85,000	C	May 2012	May 2017	Lawrence	
UBC	Travel Grant	$2,000	C	2014	2014	Lawrence	
Okanagan Basin Water Board	Reducing Water used for Irrigation by Active Management	$20,000	C	May 2012	May 2013	Lawrence	
UBC	Reducing Water Usage in Civic Parks Using Adaptive Irrigation	$10,000	C	2011	2011	Lawrence	
UBC	Travel Grant	$2,000	C	2010	2010	Lawrence	
UBC	Improving Pedagogical Efficiency and Effectiveness using an Automated Testing System	$10,000	C	2010	2012	Lawrence	
NSERC Engage	Improving the Efficiency of Network Monitoring by Database Optimization	$24,000	C	May 2010	Nov. 2010	Lawrence	
UBC Martha Piper	Reducing Water Consumption for Irrigation using a Wireless Soil Moisture Sensor Network	$25,000	C	2009	2011	Lawrence	
CFI	Distributed Database Laboratory	$99,000	C	Sept 2008	Sept 2013	Lawrence	
BCKDF	Distributed Database Laboratory	$99,000	C	Sept 2008	Sept 2013	Lawrence	
UBC	Reducing Water Consumption for Lawn Irrigation by Using a Soil Moisture Sensor Network	$5,000	C	2008	2009	Lawrence	
UBC	Building a Weather Data Archive for Scientific Discovery	$5,000	C	2007	2008	Lawrence	
NSERC Discovery	Dynamic Database Integration for Knowledge Sharing	$90,000	C	2007	2012	Lawrence	
UBC	UBC Startup	$15,000	NC	2006	2009	Lawrence	
U. Iowa	Building an Integrated Clinical and Expression Database	$35,000 USD	C	2005	2005	Lawrence	
U. Iowa	Teaching Competitive Games	$5,100 USD	C	2004	2004	Lawrence	
U. Iowa	A NEXRAD Data Warehouse	$25,000 USD	C	2003	2003	Lawrence	
NSF ITR	A Comprehensive Framework for Use of Next Generation Weather Radar (NEXRAD) Data in Hydrometeorology/Hydrology	$1,458,105 USD	C	2004	2008	Krajewski	Lawrence + 7 others
US Army Research Office	A JDBC Driver for Integration	$26,000 USD	C	2003	2003	Lawrence	
U. Iowa	Data Documentation in Unity	$2,000 USD	C	2003	2003	Lawrence	
John Deere Foundation	Exploratory Projects	$8,000 USD	C	2003	2003	Lawrence	
U. Iowa	Old Gold Fellowship	$6,000 USD	NC	2002	2002	Lawrence	
U. Iowa	U. Iowa Startup	$30,000 USD	NC	2001	2001	Lawrence	

(c) Research or equivalent contracts
(d) Invited Presentations (Identify whether International/National/Local)

Note that conference presentations associated with conference publications are not listed here.

Title	Conference/Event	Date
UBCO Town Hall (Faculty Panelist)	UBC Okanagan Town Hall	June 2021
Teaching and Learning Innovation Panel	UBC Teaching and Learning Conf.	May 2021
Using Technology for Irrigation Optimization	MATH 590 Presentation	Oct 2019
Blockchain and Databases	Blockchain Summer Institute, UBC Vancouver	May 2018
Improving Application Performance with JDBC	San Francisco Java Users Group	June 2016
Accelerate Existing Applications without Changing Code using Hazelcast and Heimdall	Online webinar	Feb 2016
Improving Application Performance with JDBC	Silicon Valley Java Users Group	May 2016
Using Technology for Golf Course Management	Annual General Meeting of Golf Superintendents of BC	Nov 2015
Techniques for Managing and Integrating Data	True North Science Bootcamp for Canadian Librarians	May 2015
Reducing Water Usage with Sensor Networks and Data Analysis	Unit 5 Seminar Series	March 2012
Reducing Water Usage with Sensor Networks and Data Analysis	IEEE Okanagan Subsection	June 2012
Unlocking the Scientific Value of Weather Radar Data	UBC Okanagan Research Week	Mar 2007
Integration Challenges in Bioinformatics	Center for Bioinformatics and Computational Biology Seminar Series (University of Iowa)	Feb 2003
Unlocking the Scientific Value of NEXRAD Weather Radar Data	Iowa Academy of Science General Meeting (Best presentation in Engineering section)	2003

(e) Other Presentations
(f) Other
(g) Conference Participation (Organizer, Keynote Speaker, etc.)

Conference Organization

- Local Arrangements, 15th Western Canadian Conference on Computing Education 2010, Kelowna, BC
- Local Arrangements, co-chair, Intelligent Systems Collaborative - AI/GI/CRV 2009, Kelowna, BC

Conference Program Committees (Reviewer)

- See conference reviewing section.

10. SERVICE TO THE UNIVERSITY

(a) Areas of special interest and accomplishments

I was the first Director of the Master of Data Science program at UBC Okanagan from 2018 to 2020 and built it into an excellent professional program. I was a member of the UBC Okanagan Senate from 2014 to 2020 and chaired the Senate Academic and Building Resource Committee from 2017 to 2020.

(b) Memberships on committees, including offices held and dates

University

Committee Name	Role	Dates	
		Start	End
Digital UBC Academic Advisory Committee	Member	Jan 2022	
NLP Focus Group (student evaluations)	Member	Dec 2021	
UBC NSERC CREATE Internal Selection Committee	Member	Mar 2022	Mar 2022
Award Committee for Killam Prize and Provost Teaching Award	Member	Mar 2022	Mar 2022
UBC Teaching Beyond COVID-19 Academic Working Group	Member	Jun 2021	Aug 2021
Board of Governors Academic Renewal Working Group	Member	Sept 2019	Jun 2021
UBC IT Capital Planning Committee	Member	Apr 2019	
Award Committee for Killam Prize and Provost Teaching Award	Member	Mar 2019	Mar 2019
UBC President's Strategic Plan Implementation Advisory Committee	Member	Aug 2018	Aug 2020
UBC VP Finance Search Committee	Member	Feb 2018	July 2018
UBC Okanagan Senate Academic and Building Resource Committee	Chair	Oct 2017	Aug 2020
UBC Exceptional Learning Working Group (system-wide)	Member	Oct 2017	Feb 2018
Award Committee for Killam Prize and Provost Teaching Award	Member	Apr 2018	Apr 2018
UBC Okanagan Senate Academic and Building Resource Committee	Member	Sept 2014	Aug 2017
UBC Okanagan Senate	Member	Sept 2014	Aug 2020
UBC Okanagan Graduate Council	Member	Sept 2010	Sept 2012
Martha Piper Fund Review Committee	Member	Oct 2009	Oct 2009

Faculty

Committee Name	Role	Dates	
		Start	End
IKBSAS Dean of Science Search Committee	Member	Feb 2020	May 2020
IKBSAS B.Sc. Review Committee	Member	Oct 2017	Apr 2019
IKBSAS Research Policy & Infrastructure Development Committee	Member	Jan 2016	Apr 2019
Curricular Innovation Award Committee	Member	Feb 2016	Feb 2016
IKBSAS Dean's Renewal Committee (elected)	Member	Feb 2013	Mar 2013
IKBSAS NSERC USRA Ranking Committee	Member	Mar 2009	Dec 2012
Irving K. Barber School of Arts and Science Curriculum Committee	Member	Sep 2006	Sep 2013

Department

Committee Name	Role	Dates	
		Start	End
Faculty sponsor for ACM-W chapter and GirlsInTech	Sponsor	Mar 2019	
Data Science Instructor Tenure Track Search Committee	Member	Jan 2020	Apr 2020
Computer Science Graduate Coordinator	Coordinator	May 2019	Jan 2020
Computer Science Tenure Track Search Committee	Chair	Dec 2018	Apr 2019
Master of Data Science Program Director (Okanagan Campus)	Director	Jan 2018	Dec 2020
Data Science Instructor and Tenure Track Search Committee	Member	Dec 2017	Apr 2018
Data Science Curriculum Committee	Member	Sept 2017	Dec 2020
Data Science Undergraduate Advisor	Advisor	Sept 2017	Dec 2020
Unit 5 Computer Science Instructor Search Committee	Member	Apr 2016	May 2016

Unit 5 Computer Science Industrial Contact	Member	Apr 2016	
Joint Search Committee for Digital Media Instructor	Member	Jan 2015	May 2015
Unit 5 Computer Science Instructor Search Committee	Member	Jan 2014	Apr 2014
Unit 5 External Head Search Committee (elected)	Member	Sept 2013	Apr 2014
Unit 5 Tenure and Promotion Committee	Member	Sept 2013	Dec 2013
Unit 5 Strategic Planning Committee	Member	Aug 2012	Jan 2013
Unit 5 Head Renewal Committee	Member	Jan 2012	Feb 2012
Coordinator for Sessional Hiring for Computer Science	Coordinator	Aug 2011	Jan 2012
Computer Science Undergraduate Advisor	Coordinator	Jan 2010	May 2013
IGS Graduate Advisor for Computer Science	Coordinator	Sept 2010	Apr 2012
Sessional Instructor Interview Committee – COSC 419D Fall 2008	Member	July 2008	July 2008
Advisory Committee to Dean to Select New Unit Head for Unit 4	Member	Jan 2008	Feb 2008

11. SERVICE TO THE COMMUNITY

(a) Memberships on scholarly societies, including offices held and dates

1999 – 2021 Member of Association for Computing Machinery (ACM)
2021 - Senior Member of Association for Computing Machinery (ACM)
2002 – 2014 Member of Institute of Electrical and Electronics Engineers (IEEE)
2014 - Senior Member of Institute of Electrical and Electronics Engineers (IEEE)

(b) Memberships on other societies, including offices held and dates
(c) Memberships on scholarly committees, including offices held and dates
(d) Memberships on other committees, including offices held and dates

Organization	Committee Name	Role	Dates	
			Start	End
University of Iowa	Iowa Informatics Initiative Review Committee	Member	Sep 2003	Apr 2004
University of Iowa	Computer Science Undergrad Curriculum Committee	Chair	Jan 2003	Dec 2004
University of Manitoba	Faculty Search Committee	Member	Sep 1997	Apr 1997

(e) Editorships (list journal and dates)

Date	Role	Journal
2009-2018	Editorial Board	International Journal of Knowledge-Based Organizations (IJKBO)

(f) Reviewer (journal, agency, etc. including dates)

Peer Teaching and Promotion Reviews

Year	Activity	# Reviewed
2022	In-class peer teaching reviews	1
2020	In-class peer teaching reviews	2
2019	In-class peer teaching reviews	9
2018	Reviewer for Promotion to Senior Instructor with Tenure for Faculty Member at UBCO	1
2018	In-class peer teaching reviews	1
2017	In-class peer teaching reviews	2
2016	In-class peer teaching reviews	5
2013	In-class peer teaching reviews	1
2012	In-class peer teaching reviews	2
2011	Reviewer for Promotion to Senior Instructor with Tenure for Faculty Member at UBCO	1
2010	Reviewer for Promotion to Senior Lecturer for Faculty Member at TRU	1

Journal Reviewing/Refereeing

Date	Journal	# Reviewed
2017	IEEE Transactions on Computer Intelligence and AI In Games	1
2016	IEEE Transactions on Computer Intelligence and AI In Games	1
2014	IEEE Transactions on Computer Intelligence and AI In Games	1
2013	Special issue of Springer's International Journal of Parallel Programming (IJPP)	5
2009	Information Sciences	1
2008	Data and Knowledge Engineering	1
2003	Electronics and Telecommunications Research Institute (ETRI) Journal	1
2003	International Journal of Neural Systems	1

Conference Reviewing/Refereeing

Date	Conference or Workshop	# Reviewed
2022	24th International Conference on Enterprise Information Systems (ICEIS 2022)	5
2022	37th ACM Symposium of Applied Computing, Database Track (SAC 2022)	
2021	23rd International Conference on Enterprise Information Systems (ICEIS 2021)	3
2021	36th ACM Symposium of Applied Computing, Database Track (SAC 2021)	
2020	22nd International Conference on Enterprise Information Systems (ICEIS 2020)	5
2020	35th ACM Symposium of Applied Computing, Database Track (SAC 2020)	
2019	21st International Conference on Enterprise Information Systems (ICEIS 2019)	5
2019	34th ACM Symposium of Applied Computing, Database Track (SAC 2019)	
2018	20th International Conference on Enterprise Information Systems (ICEIS 2018)	2
2018	33rd ACM Symposium of Applied Computing, Database Track (SAC 2018)	2
2017	19th International Conference on Enterprise Information Systems (ICEIS 2017)	5
2017	32nd ACM Symposium of Applied Computing, Database Track (SAC 2017)	2
2016	18th International Conference on Enterprise Information Systems (ICEIS 2016)	4
2016	31st ACM Symposium of Applied Computing, Database Track (SAC 2016)	3
2016	29th IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2016)	3
2015	17th International Conference on Enterprise Information Systems (ICEIS 2015)	5
2015	30th ACM Symposium of Applied Computing, Database Track (SAC 2015)	3
2014	30th IEEE International Conference on Data Engineering (ICDE 2014) – Ph.D. Symposium	3
2014	16th International Conference on Enterprise Information Systems (ICEIS 2014)	7
2014	29th ACM Symposium of Applied Computing, Database Track (SAC 2014)	3
2013	28th ACM Symposium of Applied Computing, Database Track (SAC 2013)	3
2012	International Workshop on Security and Performance in Cloud Computing 2012	1
2012	27th ACM Symposium of Applied Computing, Database Track (SAC 2012)	3
2011	International Workshop on Security and Performance in Cloud Computing 2011	2
2011	26th ACM Symposium of Applied Computing, Database Track (SAC 2011)	2
2010	25th ACM Symposium of Applied Computing, Database Track (SAC 2010)	3
2006	International Workshop on Data Integration and Semantic Web (DISWeb'06)	
2005	International Workshop on Data Integration and Semantic Web (DISWeb'05)	5
2005	High Performance Computing Symposium (HPC 2005)	1
2003	ACM Symposium on Applied Computing (SAC 2003)	1
1997	11th International Symposium on High Performance Computing Systems (HPCS 1997)	5

Grant Reviewing

Date	Grant Agency and Program	# Reviewed
2018	NSERC CRD Grant	1
2017	NSERC Discovery Grant	1
2011	NSERC Discovery Grant	1
2009	NSERC Discovery Grant	1

(g) External examiner (indicate universities and dates)

Student	Degree	Role	Institution	Date
Farzad Aminravan	Ph.D. (Mech. Eng.)	University Examiner	UBC Okanagan	Dec. 2013

(h) Consultant (indicate organization and dates)
(i) Other service to the community

Broadcast Interviews

First Broadcast	Topic	Interviewer	Program	Network
June 22, 2012	City of Kelowna Irrigation Project	Chris Walker	CBC Radio One morning show	CBC
Oct 2007	Computer Monitor Question		Good Question	CBC
Oct 2006	Internet and Email Questions		Good Question	CBC

12. AWARDS AND DISTINCTIONS

(a) Awards for Teaching (indicate name of award, awarding organizations, date)

Date	Name	Organization	Description
June 2020	**Killam Teaching Prize**	UBC Okanagan	UBC's most prestigious teaching award, the Killam Teaching Prize is awarded annually to faculty nominated by students, colleagues and alumni in recognition of excellence in teaching. Profile video: https://youtu.be/3XIcelsSwqo
April 2017	**Provost's Award for Teaching Excellence and Innovation**	UBC Okanagan	The award acknowledges teaching innovation and excellence at UBC's Okanagan campus. The winner is an exemplary role model who has and will continue to have significant impact on the culture of teaching and learning on the Okanagan campus and beyond. Award consists of a $3000 cash prize and recognition at Convocation. A faculty member may win the award only once during their career.
The UBC Okanagan Teaching Honour Roll recognizes professors who are among the top 10% in student evaluations of teaching effectiveness. The recognition was awarded until 2018.			
March 2021	Open Educational Resource Champion	UBC Okanagan	Recognizes faculty who promote use of open resources in courses
April 2020	Golden Apple Award	UBC Okanagan	Golden Apple Awards recognize faculty that support student well-being. (Campus Health)
April 2019	Golden Apple Award	UBC Okanagan	Golden Apple Awards recognize faculty that support student well-being. (Campus Health)
April 2018	UBCO Teaching Honour Roll 2016-2017	UBC Okanagan	

April 2018	Golden Apple Award	UBC Okanagan	Golden Apple Awards recognize faculty that support student well-being. (Campus Health)
April 2017	UBCO Teaching Honour Roll 2015-2016	UBC Okanagan	Only 15 faculty members selected in IKBSAS and 35 across the entire university.
April 2016	UBCO Teaching Honour Roll 2014-2015	UBC Okanagan	Only 13 faculty members selected in IKBSAS and 32 across the entire university.
April 2015	UBCO Teaching Honour Roll 2013-2014	UBC Okanagan	Only 18 faculty members selected in IKBSAS and 38 across the entire university.
April 2014	UBCO Teaching Honour Roll 2012-2013	UBC Okanagan	
April 2013	UBCO Teaching Honour Roll 2011-2012	UBC Okanagan	Only 17 faculty members selected in IKBSAS.
April 2012	UBCO Teaching Honour Roll 2010-2011	UBC Okanagan	
May 2011	UBCO Teaching Honour Roll 2009-2010	UBC Okanagan	Only 18 faculty members selected in IKBSAS.
May 2009	UBCO Teaching Honour Roll 2007-2008	UBC Okanagan	31 faculty members on campus were selected with 9 in IKBSAS.

(b) Awards for Scholarship (indicate name of award, awarding organizations, date)

Date	Name	Organization	Description
April 2017	Best Poster Award	ACM Symposium on Applied Computing (SAC)	The paper “Next Generation JDBC Database Drivers for Performance, Transparent Caching, Load Balancing, and Scale-out " won Best Poster at the SAC 2017 (out of 52 posters).
April 2016	Best Paper Award Information Systems	ACM Symposium on Applied Computing (SAC)	The paper “Improving SQL Query Performance on Embedded Devices using Pre-compilation" won Best Paper Award in Information Systems in SAC 2016.
February 2010	Best Student Paper	IEEE SAS Conference	The paper “Reducing Lawn Water Consumption using Sensor Nodes and an Adaptive Irrigation Controller” won Best Student Paper at the IEEE Sensors Applications Symposium. (out of 17 student papers)

(c) Awards for Service (indicate name of award, awarding organizations, date)

Date	Name	Organization	Description
Mar 2019	Civic Award	City of Kelowna	One of three finalists for Civic Award for Coach/Sport Administrator of the Year. https://www.kelowna.ca/our-community/news-events/news/2018-civic-community-awards-finalists-revealed
Feb 2019	Volunteer Sport Hero Award	City of Kelowna & Pacific Sport Okanagan	Awarded to an individual who has contributed significantly to Kelowna through their voluntary service to amateur sport. http://www.pacificsportokanagan.com/event-calendar/2019-community-sport-hero-awards
Oct 2017	Softball BC Minor Coordinator of the Year	Softball BC	Awarded to the coordinator that exemplifies service and dedication to the sport.

(d) Other Awards

Undergraduate and Graduate Student Awards

Date	Amount	Name	Presenter
1999-2001	$38,200	NSERC PGS B (Ph.D.)	NSERC
1998	$17,000	Gordon P. Osler Graduate Scholarship and University of Manitoba Fellowship	University of Manitoba - For outstanding merit in graduate studies and For the top recipient of the Gordon P. Osler Graduate Scholarship.
1996-2001	$30,000	TRLabs Funding	TRLabs
1996-1998	$31,200	NSERC PGS A (Master's)	NSERC
1996	$5,000	Faculty of Science Research Grant	University of Manitoba
1995		Computing Research Association Top Undergraduate (Honorable Mention). **Recognized as one of the top comp sci undergraduates in North America.**	Computing Research Association http://archive.cra.org/Activities/awards/undergrad/winners.95.html
1995	$250	Elizabeth Luginbuhl Memorial Award	University of Manitoba - For highest standing in 3rd year science
1995	$500	Benjamin Cohen Scholarship	University of Manitoba - For highest standing in science in any year
1995	$6,500	NSERC Undergraduate Research Grant	NSERC
1994-1996		Dean's Honour Role	University of Manitoba
1994	$500	Isbister Scholarship	University of Manitoba - For highest standing in science except grad year
1994	$250	Dr. Maxwell S. Rady Scholarship	University of Manitoba - For highest standing in 2nd year science
1994	$6,500	NSERC Undergraduate Research Grant	NSERC
1993-1995	$10,000	Canada Scholarship	Government of Canada - A four year national scholarship of the Canadian government given to students entering university in a science-related field.
1993	$1000	Guertin Centennial Entrance Scholarship	University of Manitoba High-school entrance scholarship
1993	50% of 1st yr tuition	Placed 1st in Manitoba in Canadian Association of Physicists (CAP) contest	
1993		Placed 2nd in Canada in Chem13 contest (Grade 12 chemistry contest)	

THE UNIVERSITY OF BRITISH COLUMBIA

Publications Record

SURNAME: Lawrence **FIRST NAME**: Ramon **Initials**:
MIDDLE NAME(S): Edward **Date**: Apr. 9, 2021

Policy on Authorship

The accepted practice for database publications in the area of computer science is that the primary author is listed first, and the order of authors roughly reflects their contribution. One notable (personal) exception is that students are almost always listed first regardless of their contribution to research and/or writing as long as they contributed to the project. This increases the recognition for the students. The supervisor is then listed as the last author of the paper.

Publication in refereed conferences is a prestigious publication venue in computer science in addition to publication in journals. The top international conferences are considered as superior publication venues for cutting-edge research, and the acceptance rates for such conferences are highly competitive. For journals, the latest impact factors available to the author are provided.

1. REFEREED PUBLICATIONS

Note: Supervised undergraduate and graduate students co-authors are underlined.

(a) Journals

Journal Publications

1) Riley Jackson, Jonathan Gresl, and Ramon Lawrence. "Efficient External Sorting for Memory-Constrained Embedded Devices with Flash Memory", *ACM Transactions on Embedded Computing Systems*, March 2021, Article No. 29, pages 1-21, https://doi.org/10.1145/3446976.

2) Matthew Fritter, Ramon Lawrence, Barbara Marcolin, and Nathan Pelletier. "A survey of Life Cycle Inventory database implementations and architectures, and recommendations for new database initiatives", *The International Journal of Life Cycle Assessment*, Number 25, pages 1522-1531, June 2020, https://doi.org/10.1007/s11367-020-01745-5.

3) Ryan Trenholm and Ramon Lawrence. "Improving Park Maintenance Efficiency using a Mobile Application", *International Journal of Mobile Devices, Wearable Technology, and Flexible Electronics*, Dec. 2019, Vol. 9., Issue 2, pages 1-17.

4) Graeme Douglas and Ramon Lawrence. "Efficient SQL Querying on Embedded Devices using Pre-Compilation", *Applied Computing Review*, June 2016, Volume 16 Number 2, pages 42-47.

5) Tyler Cossentine and Ramon Lawrence. "Efficient External Sorting on Flash Memory Embedded Devices", *International Journal of Database Management Systems (IJDMS)*, February 2013, Volume 5 Number 1, pages 1-20. URL: http://airccse.org/journal/ijdms/papers/5113ijdms01.pdf.

6) Ramon Lawrence and Vadim Bultiko. “Database-Driven Real-time Heuristic Search in Video-game Pathfinding”, *IEEE Transactions on Computational Intelligence and AI in Games*, September 2013 Volume 5 Number 3 pages 227-241.

7) Scott Fazackerley and Ramon Lawrence. “Automatic In-Situ Determination of Field Capacity using Soil Moisture Sensors”, *Journal of Irrigation and Drainage*, Volume 61:3, 416-424, 2012 (2010 IF: 1.108)

8) Vadim Bulitko, Yngvi Björnsson and Ramon Lawrence. “Case-Based Subgoaling in Real-Time Heuristic Search for Video Game Pathfinding”, *Journal of Artificial Intelligence Research*. Volume 39 (September 2010), pages 269-300. (2009 IF: 3.036)

9) Bryce Cutt and Ramon Lawrence. “Using Intrinsic Data Skew to Improve Hash Join Performance”, *Information Systems* 34:6 (September 2009): 493-510 (2010 IF: 1.966)

10) Ramon Lawrence. “Using Slice Join for Efficient Evaluation of Multi-Way Joins”. *Data and Knowledge Engineering*. 67:1 (October 2008): 118-139 (2010 IF: 1.745).

11) Ramon Lawrence, Ralph P. Russo and Nariankadu D. Shyamalkumar. “The Effect of Reading Policy on Early Join Result Production”. *Information Sciences*. 177.19 (October 2007): 3939-3956. (2008 IF: 3.095)

12) Nariankadu D. Shyamalkumar, Ralph P. Russo and Ramon Lawrence. “Optimal Policies to Obtain the Most Join Results”. *Journal of Theoretical Probability*. 20:2 (June 2007): 237-256. (2008 IF: 0.602)

13) Anton Kruger, Ramon Lawrence and Eduard C. Dragut. “Building a Terabyte NEXRAD Radar Database for Hydrometeorology Research”. *Computers & Geosciences*. 32.2 (2006): 247 - 258. (2008 IF: 1.188)

14) Ramon Lawrence. “Teaching Data Structures using Competitive Games”. *IEEE Transactions on Education*. 47.4 (November 2004): 459 - 466. (2008 IF: 0.644)

15) Ramon Lawrence. “The Space Efficiency of XML”. *Information and Software Technology*. 46.11 (September 2004): 753 - 759. (2008 IF: 1.200)

Book Chapters

16) Andrew Feltham, Nadir Ould-Khessal, Spencer MacBeth, Scott Fazackerley, Ramon Lawrence. "Linear Hashing Implementations for Flash Memory". *Enterprise Information Systems*. Springer. Invited and revised papers of ICEIS 2019. 386-405. ISBN 978-3-030-40783-4. DOI: 10.1007/978-3-030-40783-4_18 Feb 2020.

17) Michael Henderson and Ramon Lawrence. "An Evaluation of Multi-Way Joins for Relational Database Systems". *Lecture Notes in Business Information Processing 190 - Enterprise Information Systems*. Springer. Invited and revised papers from ICEIS 2013. 37 – 50. ISBN 978-3-319-09491-5. July 2015.

18) Vadim Bulitko, Yngvi Björnsson, Nathan R. Sturtevant, Ramon Lawrence. “Real-time Heuristic Search for Pathfinding in Video Games”, *Artificial Intelligence for Computer Games*. Springer. 1 – 30. IBSN 978-1441972569. January 2011.

19) Ramon Lawrence. “Motivating Students Using Competitive Programming”, *Guide to Competitive Learning*, Springer. 157 – 172. ISBN 978-84-937580-3-5. April 2010.

20) Ramon Lawrence and Ken Barker. “Integrating Data Sources using a Standardized Global Dictionary (Chapter 16)”. *New Trends in Knowledge Discovery for Business Information Systems*. 2000. 153 - 172. Presented at 4th International Conference on Business Information Systems (BIS’2000) Poznan, Poland, April 12-13th, 2000. The conference publication was refereed, and the conference paper was extended into an invited, refereed book chapter.

(b) Conference Proceedings (Refereed)

21) Sarah Foss, Tatiana Urazova, and Ramon Lawrence. "Automatic Generation and Marking of UML Database Design Diagrams", SIGCSE 2022: Proceedings of the 53rd ACM Technical Symposium on Computer Science Education, Feb 2022, pages 626–632, https://doi.org/10.1145/3478431.34993762021.

22) Scott Fazackerley and Ramon Lawrence. " Improving the Efficiency of Embedded Data Logging on NAND Flash for IoT Systems", 2021 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE), pp. 1-6, doi: 10.1109/CCECE53047.2021.9569206.

23) Scott Fazackerley, Craig Nichol, and Ramon Lawrence. "Bridging the Last Mile: Utilizing QR codes, e-Paper and Smartphones to Link Low-Power IoT Data Collection Devices to the Internet", 2021 IEEE Sensors Applications Symposium (SAS'21), pp. 1-6, DOI: 10.1109/SAS51076.2021.9530131.

24) Nadir Ould-Khessal, Scott Fazackerley, and Ramon Lawrence. "An Efficient B-tree Implementation for Memory-Constrained Embedded Systems", The 19th Int'l Conf on Embedded Systems, Cyber-physical Systems, and Applications (ESCS'21).

25) Marzi Rafieenia, Liza Wood, Mohsen Zardadi, Scott Fazackerley, and Ramon Lawrence. "Estimation of Average Annual Daily Bicycle Count Using Bike-Share GPS Data and Bike Counter Data for an Urban Active Transportation Network", 17th Int. Conference on Data Science (ICDATA’21).

26) Matthew Currie and Ramon Lawrence. "A Case Study on Record Matching of Individuals in Historical Archives of Indigenous Databases", The 20th Int'l Conf on Information & Knowledge Engineering (IKE'21).

27) Ritayu Nagpal, Sam Long, Shahid Jahagirdar, Weiwei Liu, Scott Fazackerley, Ramon Lawrence, and Amritpal Singh. "An Application of Deep Learning for Sweet Cherry Phenotyping using YOLO Object Detection", The 25th Int'l Conf on Image Processing, Computer Vision, & Pattern Recognition (IPCV'21).

28) Ramon Lawrence. "Adaptive Flash Sorting for Memory-Constrained Embedded Devices", 36th Annual ACM Symposium on Applied Computing (SAC'21), March 2021, pages 321-326. https://doi.org/10.1145/3412841.3441914.

29) Scott Fazackerley, Nadir Ould-Khessal, and Ramon Lawrence. "Efficient Flash Indexing for Time Series Data on Memory-constrained Embedded Sensor Devices", *10th Intl. Conference on Sensor Networks (SENSORNETS'21)*, Feb. 2021, ISBN 978-989-758-489-3, pages 92-99, DOI:10.5220/0010318800920099.

30) Jonathan Gresl, Scott Fazackerley, and Ramon Lawrence. "Practical Precision Agriculture with LoRa Based Wireless Sensor Networks", *10th Intl. Conference on Sensor Networks (SENSORNETS'21)*, Feb. 2021, ISBN 978-989-758-489-3, pages 131-140, DOI:10.5220/0010318800920099.

31) Riley Jackson and Ramon Lawrence. "Faster Sorting for Flash Memory Embedded Devices", *IEEE Canadian Conference on Electrical and Computer Engineering 2019 (CCECE 2019)*, May 2019, Edmonton, Canada, pages 1-5, DOI: 10.1109/CCECE.2019.8861811.

32) Andrew Feltham, Spencer MacBeth, Scott Fazackerley, and Ramon Lawrence. "Adapting Linear Hashing for Flash Memory Resource-Constrained Embedded Devices", *21st International Conference on Enterprise Information Systems (ICEIS 2019)*, Heraklion, Crete, Greece, May 2019, pages 176-181, ISBN: 978-989-758-372-8, DOI: 10.5220/0007709301760181.

33) Matthew Fritter, Nadir Ould-Khessal, Scott Fazackerley, and Ramon Lawrence. "Experimental Evaluation of Hash Function Performance on Embedded Devices", *IEEE Canadian Conference on Electrical and Computer Engineering 2018 (CCECE 2018),* Quebec City, QC, Canada, May 2018, pages 1-4, DOI: 10.1109/CCECE.2018.8447870.

34) Ramon Lawrence. "Faster Querying for Database Integration and Virtualization with Distributed Semi-Joins", *2017 International Symposium on Big Data and Data Science*, published by IEEE CPS, Las Vegas, NV, USA, Dec. 2017, pages 1406-1410, DOI:10.1109/CSCI.2017.246.

35) Wade Penson, Eric Huang, Dana Klamut, Eliana Wardle, Graeme Douglas, Scott Fazackerley, and Ramon Lawrence. "Continuous Integration Platform for Arduino Embedded Software", *IEEE Canadian Conference on Electrical and Computer Engineering 2017 (CCECE 2017),* Windsor, ON, Canada, May 2017, pages 1-4, DOI: 10.1109/CCECE.2017.7946696.

36) Ramon Lawrence, Erik Brandsberg, and Roland Lee. "Next Generation JDBC Database Drivers for Performance, Transparent Caching, Load Balancing, and Scale-out", *32nd Annual ACM Symposium on Applied Computing (SAC'17)*, Marrakech, Morocco, April 2017, pages 915-918. **Best Poster Award out of 52 posters at conference.** DOI: 10.1145/3019612.3019870.

37) Kenny Raharjo and Ramon Lawrence. "Using Multi-Arm Bandits to Optimize Game Play Metrics and Effective Game Design", *ICCG 2016: 18th International Conference on Computers and Games*, New York, USA, pages 1021-1024, DOI: doi.org/10.5281/zenodo.1126766.

38) Wade Penson, Scott Fazackerley, Ramon Lawrence. "TEFS: A Flash File System for Use on Memory Constrained Devices", *IEEE Canadian Conference on Electrical and Computer Engineering 2016 (CCECE 2016)*, Vancouver, BC, Canada, May 2016, pages 1-5, DOI: 10.1109/CCECE.2016.7726822.

39) Scott Fazackerley, Wade Penson, Ramon Lawrence. "Write Improvement Strategies for Serial NOR Dataflash Memory", *IEEE Canadian Conference on Electrical and Computer Engineering 2016 (CCECE 2016)*, Vancouver, BC, Canada, May 2016, pages. 1-6, DOI: 10.1109/CCECE.2016.7726758.

40) Graeme Douglas and Ramon Lawrence. "Improving SQL Query Performance on Embedded Devices using Pre-Compilation", *31st Annual ACM Symposium on Applied Computing (SAC'16)*, Pisa, Italy, April 2016, pages 961-964. **Best Paper Award.** DOI: 10.1145/2851613.2851657.

41) Scott Fazackerley, Eric Huang, Graeme Douglas, Raffi Kudlac, Ramon Lawrence. "Key-Value Store Implementations for Arduino Microcontrollers", *IEEE Canadian Conference on Electrical and Computer Engineering 2015 (CCECE 2015)*, Halifax, Canada, pages 158-164. DOI: 10.1109/CCECE.2015.7129178.

42) Giuseppe Burtini, Jason Loeppky and Ramon Lawrence. "Improving Online Marketing Experiments with Drifting Multi-Armed Bandits", *17th International Conference on Enterprise Information Systems (ICEIS 2015)*, Barcelona, Spain, pages 630-636. ISBN: 978-989-758-096-3.

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63) Uchang Park and Ramon Lawrence. “A Database Integration System Based on Global View Generation”. *9th International Conference on Enterprise Information Systems*. Jun, 2007. 453-456.

64) Eduard C. Dragut and Ramon Lawrence. “Reducing the Cost of Validating Mapping Compositions by Exploiting Semantic Relationships”. *On the Move to Meaningful Internet Systems 2006: CoopIS, DOA, GADA, and ODBASE (LNCS 4275)*. Montpellier, France. 882 - 890. [25% acceptance rate]

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79) Ramon Lawrence and Ken Barker. “Querying Relational Databases without Explicit Joins”. *ER 2001 Workshops, HUMACS, DASWIS, ECOMO, and DAMA (Lecture Notes in Computer Science 2465).* Yokohama, Kanagawa, Japan. Nov, 2001. 278 - 291. [28% acceptance rate]

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(c) Other

Technical Reports

Note: Technical reports are non-refereed documents that are made publically available by the institution.

- Ramon Lawrence. *A Cost-Based Approach for Converting Relational Schemas to XML (TR-05-02)*. University of Iowa. Mar, 2005. 23 pages.
- Terrence Mason, Lixin Wang and Ramon Lawrence. *AutoJoin: Providing Freedom from Specifying Joins (TR-04-03)*. University of Iowa. Mar, 2004. 14 pages.
- Alina Bejan and Ramon Lawrence. *Peer-to-Peer Cooperative Driving (TR-02-04)*. University of Iowa. Jun, 2002. 14 pages.
- Ramon Lawrence and Ken Barker. *Unity - A Database Integration Tool*. TRLabs. Dec, 2000. 5 pages.

Posters and Presentations

Note: These posters and papers are “lightly” refereed. Acceptance is based on submitted abstracts to the conference committee. Presentations at the American Geophysical Union (AGU) meetings are very highly regarded in the geophysics and hydrological research communities. These presentations are on the NEXRAD archive project (NSF ITR funded).

- A. Kruger, W. F. Krajewski, A. A. Bradley, J. A. Smith, M. L. Baeck, M. Steiner, R. Lawrence, M. K. Ramamurthy, J. Weber, S. A. Delgreco, P. Domaszczynski, B. Seo. Techniques for Efficiently Managing Large Geosciences Data Sets. *Eos Trans. AGU, 88(52)*, Fall Meet. Suppl., IN23A-0951, December 2007.
- A. Kruger, W. F. Krajewski, A. A. Bradley, J. A. Smith, M. L. Baeck, M. Steiner, R. Lawrence, M. K. Ramamurthy, J. Weber, S. A. Delgreco, P. Domaszczynski, B. Seo. Techniques for Efficiently Managing Large Geosciences Data Sets. *Eos Trans. AGU, 88(52)*, Fall Meet. Suppl., IN23A-0951, 2007. (Poster)
- A. Kruger, A. A. Bradley, W. F. Krajewski, R. Lawrence, J. A. Smith, M. L. Baeck, M. Steiner, M. Ramamurthy, J. Weber, S. A. Del Greco, F. M. V. Murthy, and D. Dhutia. NEXRAD-ITR: Developing a

framework for use of NEXRAD data in hydrology and hydrometeorology. *22nd International Conference on Interactive Information Processing Systems (IIPS), Session: Radar IIPS and Applications Part I*, Paper 9.3 and Poster P2.10, The 86th AMS Annual Meeting, Atlanta, Georgia, January 26-February 2, 2006.

- A. Kruger, W. F. Krajewski, A. A. Bradley, J. A. Smith, M. Steiner, M. L. Baeck, R. Lawrence, M. K. Ramamurthy, J. Weber, S. L. DelGreco, P. Domaszczynski, C. Gunyon, B. Seo. Towards Better Utilization of NEXRAD Data in Hydrology – an Update. *EOS Trans. AGU, 87(52)*, Fall Meet. Suppl., Abstract IN13E-08, 2006.
- A. Kruger, A. A. Bradley, W. F. Krajewski, R. Lawrence, J. A. Smith, M. L. Baeck, M. Steiner, M. Ramamurthy, J. Weber, S. A. Del Greco, F. M. V. Murthy, and D. Dhutia. NEXRAD-ITR: Developing a framework for use of NEXRAD data in hydrology and hydrometeorology. *22nd International Conference on Interactive Information Processing Systems (IIPS)*, Poster P2.10, The 86th AMS Annual Meeting, Atlanta, Georgia, January 26–February 2, 2006.