



2017

ANNUAL REPORT

Centre for Information Integrity
and Information Systems Assurance



UNIVERSITY OF
WATERLOO

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MISSION

The mission of the University of Waterloo Centre for Information Integrity and Information Systems Assurance (UW CISA) falls under three headings:

RESEARCH

Identify, create and deliver research addressing the expanding boundaries of information integrity and assurance;



EDUCATION AND KNOWLEDGE TRANSFER

Support and promote the marketing and delivery of innovative educational activities and materials related to information integrity and assurance issues; Identify, communicate and promote information integrity and assurance issues that are important to professionals working in these areas;



INTERACTION

Support and promote interaction on information integrity and assurance issues among practitioners, educators and students.





BACKGROUND

The University of Waterloo is a leading university in Canada and is well known for its information technology related research, teaching and entrepreneurship. The School of Accounting and Finance (SAF) is one of Canada's leading academic units in the accounting and finance fields and has both a Canada-wide and international reputation.

The SAF is a strong supporter of the information integrity and information systems assurance fields, as demonstrated by its leading courses and programs in these areas and related research they have spawned. For information please visit: uwaterloo.ca/school-of-accounting-and-finance/our-programs.

UW CISA was founded in 1998 by the School of Accounting and Finance at the University of Waterloo. The founding sponsors were the Chartered Professional Accountants of Canada (CPA Canada) and the Information Systems Audit and Control Association (ISACA).¹ The sponsors' objectives were to improve the quality of education and research in information integrity and information systems assurance, and to foster a close and continuing working relationship between the School, the sponsors and other partners with an interest in information integrity and information systems assurance.

UW CISA was renamed from the Centre for Information Systems Assurance to the Centre for Information Integrity and Information Systems Assurance in 2008 (retaining the acronym UW CISA) in recognition of the need to broaden UW CISA's mandate and activities beyond systems assurance to information integrity. UW CISA is an administrative sub-unit within the Centre of Accounting Research and Education (CARE).

¹The following name changes have taken place since the founding of UW CISA. ISACA replaced Information Systems Audit and Control Association on January 1, 2006. The School of Accounting and Finance replaced The School of Accountancy on November 19, 2007. Chartered Professional Accountants of Canada (CPA Canada) replaced Canadian Institute of Chartered Accountants (CICA) on April 1, 2013.

A NOTE FROM THE DIRECTOR



To the Board of Directors:

I am pleased to present this report on the operations and activities of the University of Waterloo Centre for Information Integrity and Information Systems Assurance during 2017, our twentieth year of operation.

This year marks the second year in a renewed three-year funding commitment by UW CISA's sponsors for the period 2016–2018, inclusive.

During the year, we continued our thought leadership role through service on CPA Canada's Assurance Innovation Committee (AIC) and the AICPA's Trust Services Information Integrity, Cybersecurity, and Data Analytics Task Forces. We also continued our research activities related to information integrity, IT governance, risk and internal control, business model and business process documentation, XBRL, blockchain, and data analytics and presented our research at a number of conferences as detailed in the report. During the year, we saw a number of publications result from these efforts as detailed in this report. Our work in progress includes projects addressing IT governance, risk and internal control, cybersecurity, information integrity, business model presentation for Integrated Reporting <IR>, machine learning, AI and robotics, and data analytics and visualization.

I am delighted to report that our research productivity in the field of accounting information systems has been recognized by our second place ranking in the global rankings of universities produced by Brigham Young University. These rankings are based on

classifications of peer reviewed articles in 12 key accounting journals since 1990.

During the year we held PD sessions on IDEA, Tableau, R and Cybersecurity Reporting and Assurance. We are planning to expand our PD offerings in the areas of blockchain technology, data analytics and visualization, machine learning and cybersecurity during the coming year.

We continue to work with other Centres with similar purposes, strengthening an international network for mutual support of our respective missions. We are also working to expand our relationship with the Institute of Internal Auditors (IIA) which has accredited UWaterloo's internal auditing education curriculum under its IAEP program. We are co-sponsoring the 2019 Ethics Symposium on The Impact of Technology on Ethics, Professionalism and Judgement in Accounting to be held in April 2019 and we have started planning for our 11th Biennial Research Symposium on Information Integrity and Information Systems Assurance to be held in October 2019.

We continue to welcome new partners to share in our mission. I thank UW CISA's Board members and sponsors for their continued support. I look forward to working closely with all of you in the future.

Respectfully,

A handwritten signature in black ink, appearing to read 'J.E. Boritz', written over a light blue horizontal line.

DR. J.E. BORITZ, FCPA, FCA, CISA
DIRECTOR

RESEARCH



THOUGHT LEADERSHIP

UW CISA provided thought leadership in several areas during 2017.

Our research productivity in the field of accounting information systems continues to be recognized by our second place ranking in the global rankings of universities produced by Brigham Young University. These rankings are based on classifications of peer reviewed articles in 12 accounting journals since 1990. For more information about the rankings visit: byuaccounting.net/rankings/univrank/rankings_per_univ.php?univ=586&univname=University%20of%20Waterloo.

BIG DATA/DATA ANALYTICS

Guide to Audit Data Analytics. Work on this guide was co-funded by the AICPA and CPA Canada. The guide updates the AICPA guide on Analytical Procedures with information on Audit Data Analytics. Author Greg Shields was supported by an AICPA Task Force of which the Director is a member. CPA Canada's Audit Data Analytics Committee of which Theo Stratopoulos is a member has adapted the guide for Canadian standards. The US guide was published in mid-2017 and the Canadian guide will be published in May 2018.

Audit Data Analytics (ADA): Current State & Future Directions. Research Team is Theo Stratopoulos and Clark Hampton. The objective is to summarize the current state of data analytics in Canada. This paper was presented at the AAA 2016 Accounting IS Big Data Conference in San Francisco, CA, September 15-16, 2016. Funding for the survey was provided by CPA Canada.

Audit Data Analytics Use: An Exploratory Analysis. Research Team is Theo Stratopoulos, Clark Hampton and Chris Wolf. This paper was presented at the AIS/SET midyear meeting in Orlando, FL, January 19-21, 2017.

Big Data and Analytics: Opportunity or Threats for the Accounting Profession. Research Team is Greg Richins,

Andrea Stapleton, Theo Stratopoulos and Chris Wong. The objective is to discuss the anticipated impact of big data on the accounting profession. This paper was presented at the *Journal of Information Systems* (JIS) Conference in Pleasanton, CA, October 2016 and published in JIS, Fall 2017.

CYBERSECURITY

Are External Auditors Concerned about Cyber Incidents? Evidence from Audit Fees. Research team is He (Stanley) Li and Won Gyun No, Rutgers University, and Efrim Boritz. The objective is to explore issues related to cybersecurity with relevance to risk management, internal control, and assurance. This paper was presented at the AAA midyear meeting of the Auditing Section, January 12-14; the AAA midyear meeting of the AIS/SET section January 19-21, 2017, in Orlando, FL; Monash University in Melbourne, Australia, March 10, 2017; and at the International Symposium on Accounting Information Systems (ISAIS) held in Valencia, Spain, May 8-9, 2017. It is under review at *Auditing: A Journal of Practice & Theory* (AJPT).

The Impact of Information Security Breaches and IT Security Investments on a Firm's Competitors. Research team is Christina Y. Jeong, Sang-Yong Tom Lee and Jee-Hae Lim. The objective of this study is to investigate how security breaches and IT security investments influence a firm's competitors. This paper was presented at the International Conference on Information Systems (ICIS), Seoul, South Korea, December 10-13, 2017.

Do the Roles of the CEO and CFO Differ when it comes to Data Security Breaches? Research team is Jacob Haislip, Jee-Hae Lim, and Robert Pinsker. The objective of this study is to investigate the roles of IT governance actors with IT expertise, and further examine how firms make IT governance changes following reportable data security breaches. This paper was presented at the Americas Conference on Information Systems (AMCIS), Boston, MA, August 10-12, 2017.

AICPA Cybersecurity Working Group. The Director is part of the working group that produced the *Guide on Reporting on an Entity's Cybersecurity Risk Management Program and Controls* issued May 1, 2017 by the AICPA.

BUSINESS RISK ASSESSMENT

Business Models and Business Model Descriptions: A Research Synthesis. Research team is Efrim Boritz and Giselle White. This paper addresses a series of research questions aimed at exploring the nature of business models and business model descriptions to better understand how they are and can be used in accounting and auditing. It was presented at the AAA annual meeting in New York, NY, August 2016.

INFORMATION INTEGRITY

Information Integrity Control Guidelines. Project team is Efrim Boritz and Malik Datardina, Avenir. The objectives are to: 1) define information integrity and to identify information integrity risks and controls for mitigating those risks; 2) define assurance practices for information integrity services; 3) interview or survey audit team members about their views on information integrity risks, controls and assurance practices. Funding is being provided by CPA Canada. The *Framework for Information Integrity Controls* published by CPA Canada is forthcoming in 2018.

IT GOVERNANCE, RISK AND INTERNAL CONTROL

Understandability of Auditors' Internal Control Reports. Research Team is Efrim Boritz, Louise Hayes, University of Guelph and Lev Timoshenko, University of Calgary. The objective is to evaluate information content of SOX 404 internal control reports. This paper was presented at the AAA annual meeting in Atlanta, GA, August 2014; the AAA annual meeting in Chicago, IL, August 2015; the World Banking and Finance Conference in Hanoi, Vietnam, December 2015; and the AAA annual meeting in New York, NY, August 2016. This paper is being prepared for journal submission.

Exercising Due Diligence in Studies of Duration of Competitive Advantage Due to Emerging Technology Adoption. Research by Theo Stratopoulos. The objective of this study is to propose a due diligence process for future studies aiming to investigate the duration of competitive advantage due to emerging technology adoption. This paper was published in *Journal of Emerging Technologies in Accounting* (JETA), Spring 2017.

Does Information Technology Reputation Affect Bank Loan Terms? Research team is Jeong-Bon Kim, Byron Y. Song and Theo Stratopoulos. The objective is to investigate whether Information Technology (IT) reputation, captured by the accumulation of consistent IT capability signals, influences bank loan contracting even though banks have access to inside information. This paper is forthcoming in *The Accounting Review*.

Mapping IT Spending Across Industry Classifications: An Open Source Dataset. Research team is Duane B. Kennedy and Theo Stratopoulos. The objective of this study is to compile a data set of industry level IT spending based on publicly available information and make it available as an open source data set. This paper was presented at the AAA-AIS midyear meeting in Orlando, FL, January 19–21, 2017.

Emerging Technology Adoption and Expected Duration of Competitive Advantage. Research by Theo Stratopoulos. The objective of this study is to provide a framework for predicting expected duration of competitive advantage due to emerging technology adoption, and suggest a process for generating technology-specific predictions. This paper was submitted to the 2018 European Conference on Information Systems.

IT Capability Reputation: Antecedents and Implications. Research team is Jee-Hae Lim, Theo Stratopoulos and Tony S. Wirjanto. The objective of this study is to determine which firms are more likely to project IT capability signals to external stakeholders and whether IT capability reputation matters. This paper is being prepared for journal submission.

INTEGRATED REPORTING

Business Models in Integrated Reporting. Research team is Efrim Boritz and Giselle White. The objective is to review and evaluate the presentation of business models in integrated reports. This paper was presented at the AAA annual meeting in New York, NY, August 2016 and the International Symposium on Accounting Information Systems (ISAIS) in Valencia, Spain, May 8–9, 2017. This paper is under review at the *International Journal of Accounting Information Systems* (IJAIS).

Communicating Value Creation in Integrated Reporting. Research team is Efrim Boritz and Giselle White. The objective

is to review and evaluate the presentation of value creation information in integrated reports. This project is in pilot testing.

MACHINE LEARNING, AI AND ROBOTICS

Classifying Restatements: An Application of Machine Learning and Textual Analysis. Research team is Louise Hayes, University of Guelph and Efrim Boritz. The objective is to explore uses of machine learning technologies with applications to accounting and auditing. This paper was presented at the AAA annual conference in New York, NY, August 2016; the AAA midyear meeting in Orlando, FL, January 12–14, 2017; the European Auditing Association Conference in Valencia, Spain, May 10–12, 2017; and World Banking and Finance Conference in Sardinia, Italy, July 28–29, 2017. This paper is being prepared for journal submission.

Do Differences in CFO Background Matter to Financial Statement Quality? An Application of Machine Learning and Textual Analytics. Research team is Louise Hayes, University of Guelph and Efrim Boritz. The objective is to explore uses of machine learning technologies with applications to accounting and auditing. This paper was presented at the CAAA annual conference in Montréal, QC, June 1–3, 2017 and the AAA annual meeting in San Diego, CA, August 5–9, 2017. This paper is being prepared for journal submission.

Robotics, Controls and Assurance. Research team is Robert Parker and Efrim Boritz. The objective is to consider the impact of the developing uses of robots on risk, control and assurance issues.

USE OF SPECIALISTS IN AUDITING

Auditors' and Specialists' Views about the Use of Specialists during an Audit. Research team is Efrim Boritz, Natalia Kochetova, St. Mary's University, Linda Robinson and Chris Wong. The objective is to describe current practices in using specialists in the audit. This paper was presented at the CAAA annual conference in Edmonton, May 2014; the AAA auditing section midyear meeting in Miami, January 2015; the European Accounting Association (EAA) Annual Conference in Glasgow, Scotland, April 2015; the Public Company Accounting Oversight Board (PCAOB) Standards Advisory Group Meeting in 2015; and the International

Symposium on Audit Research (ISAR) in Boston, MA, June 2015. This paper is currently being revised for resubmission.

XBRL

The Quality of Interactive Data: XBRL versus Compustat, Yahoo Finance, and Google Finance. Research team is Efrim Boritz and Won Gyun No. This paper was presented at the 25th XBRL International Conference in Yokohama, Japan, November 2012, the AAA IS section midyear meeting in Ft. Lauderdale, FL, January 2013, the 26th XBRL International Conference in Dublin, Ireland, April 2013, and the AAA annual meeting in Anaheim, CA, August 2013. It was on SSRN's top download list for several months in the spring and summer of 2013. This paper is currently being revised for resubmission.

The Impact of Senior Management Competencies on the Voluntary Adoption of an Innovative Technology. Research Team is Efrim Boritz, Jap Efendi, University of Sydney, Australia, and Jee-Hae Lim. The objective is to determine which management competencies (IT or Financial) were most strongly associated with voluntary adoption of XBRL during the SEC's XBRL voluntary filing program. This paper was presented at the XBRL 25th International Conference in Yokohama, Japan, November 2012, the AAA IS section midyear meeting in Ft. Lauderdale FL, January 2013; the International Conference on Information Systems (ICIS) in Auckland, NZ, December 2014; and at Queensland University of Technology in Brisbane, AU, November 2015. This paper is forthcoming in the *Journal of Information Systems* (JIS).

Can Detailed Tagging of Footnotes Improve Analysts' Forecast Accuracy and Dispersion? Research team is Andrew J. Felo, Joung W. Kim, and Jee-Hae Lim. The objective is to investigate whether the properties of analysts' forecasts are improved after detailed tagging of footnote information. The paper was presented at the AAA joint AIS/SET section midyear meeting January 19–21, 2017, in Orlando, FL and International Symposium on Accounting Information Systems (ISAIS), Valencia, Spain, May 8–9, 2017. This paper is forthcoming in the *International Journal of Accounting Information Systems* (IJ AIS).

XBRL Adoption and Bank Loan Contracting: Early Evidence. Research team is Gary Chen, Jeong-Bon Kim, Jee-Hae Lim and Jie Zhou. The objective is to examine how the adoption of XBRL for financial reporting impacts

the pricing of bank loans. This paper was presented at the CAAA annual conference in Toronto, May 2015 and is forthcoming in the *Journal of Information Systems* (JIS).

The Effect of XBRL Adoption on the Receipt and Remediation of SEC Comment Letters. Research team is Min Jeong (Minna) Hong, and Jee-Hae Lim. The objective is to examine the effect of XBRL and the extent of customized extension element usage on the SEC's review process. This paper was presented at the AAA midyear meeting of the AIS/SET section January 19–21, 2017, in Orlando, FL, the 40th Annual Congress of the European Accounting Association (EAA), Valencia, Spain, May 10–12, 2017, and the 2017 Conference on the Convergence of Financial and Managerial Accounting Research, Banff, AB, June 19–21, 2017.

TRUST SERVICES

Trust Services Information Integrity Task Force. The Director is serving on the AICPA task force to update Trust Services Principles and Criteria. The task force is also updating the 2015 Guide on Reporting on Controls at a Service Organization (SOC 2®) for publication in 2018.

FUNDING SPECIFIC RESEARCH AND EDUCATION PROJECTS

UW CISA's funding comes from donations provided by our generous sponsors, research grants from various agencies, professional development offerings and publication revenues. UW CISA is exploring new fundraising options to help establish a full-time staff to conduct its research, education and professional development offerings and activities on a long-term, sustainable basis.

We welcome new partners to help us achieve UW CISA's mission.

FELLOWSHIPS AND SCHOLARSHIPS

UW CISA makes funds available for Visiting Fellows and doctoral students. Our next fellow, Dr. Miklos Vasarhelyi of Rutgers University, will be visiting in 2018.

SPONSORING RESEARCH SYMPOSIUM

Information Integrity and Information Systems Assurance Symposium

The 10th Biennial Research Symposium was held October 19–21, 2017 at the Toronto Marriott City Centre (Renaissance) Hotel, One Blue Jays Way, Toronto, Canada. The symposium was sponsored by the University of Waterloo, CPA Canada, Avenir, ISACA Toronto Chapter, CaseWare Analytics, the Canadian Academic Accounting Association, the Strategic and Emerging Technologies Section of the American Accounting Association and the *International Journal of Accounting Information Systems*.

SPONSORS

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PROGRAM

THURSDAY, OCTOBER 19, 2017

Welcome Reception

FRIDAY, OCTOBER 20, 2017

Opening Remarks

- › James Barnett, Director of School of Accounting & Finance, University of Waterloo
- › Bill Swirsky, Chair, UW CISA
- › Efrim Boritz, Director, UW CISA

Panel on Blockchain Technology

Moderator: Alan Wunsche, Leading Knowledge Ltd.
Panelists: Malik Datardina, Deloitte;
Skip White, University of Delaware

Designing Privacy-Preserving Blockchain based Accounting Information Systems

Moderator: Bob Cuthbertson, UW CISA
Presenters: Yunsen Wang* and Alexander Kogan, Rutgers University
Discussants: Uday Murthy, University of South Florida;
Robert Reimer, PwC

Panel on Audit Data Analytics

Moderator: Taryn Abate, CPA Canada
Panelists: Kam Grewal, EY; Nicole Deschamps, Deloitte;
Jean-François Trépanier, Raymond Chabot
Grant Thornton; Michael Alles, Rutgers University

Can Vivid and Interactive Displays of Non-Financial Information Counteract the Effect of Financial Information in Digital Annual Reports?

Moderator: Brad Pomeroy, University of Waterloo
Presenters: Yibo (James) Zhang* and Uday Murthy, University of South Florida
Discussants: Dan Stone, University of Kentucky;
Greg Shields, CPA Canada

Panel on Rutgers AICPA Data Analytics Research Initiative (RADAR)

Moderator: Miklos Vasarhelyi, RADAR
Panelists: Won Gyun No, Rutgers University; Yunsen Wang, Rutgers University; Amy Pawlicki, AICPA

PCAOB Inspections: An analysis of entity-level and application-level control audit deficiencies

Moderator: Louise Hayes, University of Guelph
Presenters: Maureen Mascha*, Melvin Lamboy Ruiz, and Diane Janvrin, Iowa State University
Discussants: Rajendra P. Srivastava, University of Kansas;
Chris Anderson, VP Risk, Rogers Communications

Panel on Audit Automation (with a focus on small and medium size audit practices)

Moderator: Phil Cowperthwaite, Cowperthwaite Mehta
Panelists: Malik Datardina, Avenir;
Julian "Jules" Hawkins, Hawkins & Co.

SATURDAY, OCTOBER 21, 2017

Proposal Readability, Firm Size and Engagement Success: Do More Readable Proposals Win Governmental Audit Engagements?

Moderator: Kieng Iv, Real Matters
Presenters: Yu-Tzu Chang and Dan Stone*, University of Kentucky
Discussants: Mary Curtis, University of North Texas;
Jerry Gaertner, Managed Analytic Services Inc.

Creating Value in Online Communities Through Governance and Stakeholder Engagement

Moderator: Adam Vitalis, University of Waterloo
Presenters: Carla Wilkin*, John Campbell, Stephen Moore, and Jason Simpson, Monash University
Discussants: Kevin Kobelsky, University of Michigan – Dearborn; Ray Henrickson, former VP of Information Systems and Technology Audit at Scotiabank

Cybersecurity Risk Disclosure and Cybersecurity Disclosure Guidance

Moderator: Robert Parker, UW CISA
Presenters: He (Stanley) Li, Won Gyun No*, Tawei (David) Wang, Miklos A. Vasarhelyi, Southwestern University of Finance and Economics, China, DePaul University and Rutgers University
Discussants: Severin Grabski, Michigan State University;
Cathy Cobey, EY

* indicates presenting author

EDUCATION AND KNOWLEDGE TRANSFER



on and

Non-Accident

University of Waterloo
Centre for
Information Integrity
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Systems Ass

DEVELOPING COURSES, WORKSHOPS, CASES AND OTHER TEACHING MATERIAL

COURSES

IT COMPETENCIES

The Director is involved in consultations aimed at revising the IT Competency section of CPA Canada's Competency Map.

IT LAW

Under the leadership of Darren Charters UW CISA sponsored the development and implementation of a course in IT Law.

IT CONTROLS AND ASSURANCE

Under the leadership of Malik Datardina of Avenir, UW CISA sponsored the development and implementation of a course on technology, assurance and innovation. The course covers core concepts of IT control and assurance and also explores exponential technologies such as the Internet of Things (IoT), blockchain and AI.

DATA ANALYTICS AND VISUALIZATION

Under Theo Stratopoulos' leadership and with the assistance of Malik Datardina of Avenir, Kieng Iv of Real Matters and May Leung of Deloitte, UW CISA sponsored the development and implementation of a Business Analytics stream within the accounting program at the University of Waterloo. In addition to pre-requisite foundation courses in Statistics, Business Systems and Accounting Information Systems, the program includes the following courses: Introduction to Data Analytics and Visualization; Intermediate Data Analytics and Visualization; Data Analytics for Assurance and Fraud Detection.

Theo Stratopoulos and Greg Shields are writing a book on "Audit Data Analytics with R" which leverages a very large data set from the HUB of Analytics Education to show how to leverage R to perform audit data analytics.

Theo Stratopoulos participated on the Data Analytics Curriculum panel on Teaching Approaches & Resources at

the AAA annual meeting in San Diego, CA on August 7, 2017 and presented to senior audit partners on opportunities to leverage data analytics in accounting at the "Partners' Conference," October 6, 2017.

CYBERSECURITY

The Director assisted by Malik Datardina and Rutgers University are developing an online course that will cover Cybersecurity risk management and controls.

The Director organized and participated on Cybersecurity Risk Management Program Examination Engagement panels at both the AAA auditing section midyear meeting on January 14, 2017 and the joint midyear meeting of the AIS & SET sections on January 20, 2017, in Orlando, FL.

WORKSHOPS

Data analytics and data visualization workshops on using IDEA, TABLEAU and R were presented by Kieng Iv, May Leung and Theo Stratopoulos in advance of UW CISA's 10th biennial symposium on October 19, 2017.

A cybersecurity reporting and assurance workshop sponsored by EY/AICPA was presented by Amy Pawlicki, Chris Halterman and Efrim Boritz at the AAA annual meeting in San Diego, CA on August 6, 2017, as well as in advance of UW CISA's 10th biennial symposium on October 19, 2017.

SHARING MATERIAL WITH OTHER EDUCATORS

A variety of materials is available for use by academics and practitioners. For information, please contact the Director.

INTERACTION



ALLIANCES AND RELATIONSHIPS

As part of its mission to interact with academe and practice, UW CISA seeks to create and sustain relationships with academic units with similar objectives and professional associations with an interest in information integrity and information systems assurance. During the year, UW CISA supported the following activities:

- › Louise Hayes is a member of CPA Canada's Audit and Assurance Technology Committee.
- › Theo Stratopoulos, Kieng Iv and May Leung are members of CPA Canada's Audit Data Analytics Task Force.
- › Malik Datardina is a member of CPA Canada's Audit Data Analytics Committee, Technology Advisory Committee, and Audit and Assurance Technology Committee.
- › The Director is a member of CPA Canada's Assurance Innovation Committee and the AICPA's Trust Services Information Integrity Task Force, CyberSecurity Assurance Task Force and Audit Data Analytics Task Force.

DISSEMINATING BEST PRACTICES

CONFERENCES

Centre personnel made presentations at a number of conferences during 2017:

- › American Accounting Association (AAA) Annual Meeting,
- › AAA Accounting IS Big Data Conference,
- › AAA Accounting Information Systems Section Mid-year Meeting,
- › AAA Auditing Section Midyear Meeting,
- › AAA Journal of Information Systems (JIS) Conference,
- › AAA Strategic and Emerging Technologies (SET) Section Midyear Meeting,
- › Canadian Academic Accounting Association (CAAA) Annual Conference,
- › Conference on the Convergence of Financial and Managerial Accounting Research,

- › European Accounting Association Annual Conference,
- › International Conference on Information Systems (ICIS),
- › International Symposium on Accounting Information Systems,
- › World Banking and Finance Conference.

COMMUNICATION

WEBSITE AND SOCIAL MEDIA OUTREACH

UW CISA's website, uwaterloo.ca/uwaterloo-centre-for-information-system-assurance, serves as UW CISA's portal. It includes calls for papers and research proposals, a resources section, a number of links and downloadables, and the IS Assurance blog.

UW CISA's most current Annual Report is posted to the website and summarizes the current year's activities. The reports are disseminated both electronically and in hardcopy formats. Past reports can be requested online at: uwaterloo.ca/uwaterloo-centre-for-information-system-assurance/annual-reports/request-annual-report.

Our website is linked to key social networks such as Facebook, LinkedIn, YouTube and Twitter. These social networks give us an opportunity to share information (like the flyer for the Symposium) with people who would not normally be closely tied to our Centre.

Articles in ISACA's Toronto Chapter Newsletter have been used to communicate UW CISA's activities to Chapter members.

IS ASSURANCE WEBLOG

Malik Datardina maintains our blog at: UWCISA-assurance.blogspot.com.

FUTURE PLANS

In the next twelve months, UW CISA will maintain its current research, education and knowledge transfer, and interaction activities, and will undertake new initiatives as well. Plans for each key category are outlined below.

RESEARCH

THOUGHT LEADERSHIP

UW CISA will continue working on the following projects during 2018:



- › **Big Data/Data Analytics**
- › **Blockchain Technology** – Through a workshop and publications we will contribute to the development of understanding of this technology among accounting, finance and assurance practitioners and academics.
- › **Business Risk Assessment**
- › **Business Model Descriptions and Business Risk Assessment** – One paper on this topic will be completed and submitted for presentation at various conferences and publication.
- › **Cybersecurity** – Through membership on the AICPA Trust Services Task Force we will contribute to the development of criteria for reporting on an entity's cybersecurity risk management program. One paper on this topic will be presented at various conferences and submitted for publication.
- › **Information Integrity** – One monograph on this topic is being prepared for publication, and a new project will be started.
- › **IT Governance, Risk and Internal Control** – Two papers on this topic will be completed and submitted for presentation at various conferences and publication.

- › **Integrated Reporting** – Two papers on this topic will be completed and submitted for presentation at various conferences and publication.
- › **Machine Learning, AI and Robotics** – Two papers in this area are being prepared.
- › **Use of Specialists** – One paper on this topic is being revised for presentation and publication, and a new project will be started.
- › **XBRL** – Two papers on this topic will be completed and submitted for presentation at various conferences and three papers are being prepared for publication.

FUNDING SPECIFIC RESEARCH AND EDUCATION PROJECTS

UW CISA's fundraising committee will continue seeking ways to expand the funding base for UW CISA. We invite partners to join us in our mission to improve the integrity of information and the quality and reliability of information systems and the processes used to create, implement, operate, maintain and change them.

RESEARCH PROPOSALS

For Research Proposal Guidelines, visit:
uwaterloo.ca/uwaterloo-centre-for-information-system-assurance/call-proposals.

FELLOWSHIPS AND SCHOLARSHIPS

UW CISA will make funds available for Visiting Fellows and doctoral students. For details, contact the Director.

During the summer of 2018 UW CISA will host a visit by Dr. Miklos Vasarhelyi of Rutgers University, New Brunswick, New Jersey, USA.

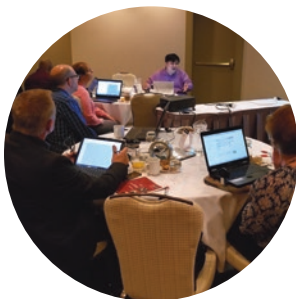
SPONSORING RESEARCH SYMPOSIUM

UW CISA is pleased to be partnering with the University of Waterloo Centre for Accounting Ethics, CPA Canada and the Journal for Business Ethics to offer a Symposium on the Impact of Technology on Ethics, Professionalism and Judgement in Accounting to be held in April 2019. More information is available on our website at: uwaterloo.ca/uwaterloo-centre-for-information-system-assurance/news/uwcisa-partners-uwcae-and-cpa-canada-impact-technology.

We are also planning for the 11th Biennial Research Symposium to be held in October 2019. We invite papers and proposals for panels on topics related to UW CISA's mission.

EDUCATION AND KNOWLEDGE TRANSFER

DEVELOPING COURSES, WORKSHOPS, CASES AND OTHER TEACHING MATERIAL



COURSES

Under Theo Stratopoulos' leadership and with the assistance of Malik Datardina and Kieng Iv UW CISA has sponsored the development of a Business Analytics stream at the University of Waterloo. The program will be expanded in 2018.

WORKSHOPS

PD Workshops developed by UW CISA on Blockchain Technologies for Accounting, Auditing and Assurance, Cybersecurity Risks, Controls and Assurance, Data Analytics and Data Visualization, and Machine Learning are being planned for 2018.

SHARING MATERIAL WITH OTHER EDUCATORS

UW CISA will continue to share its material with educators around the world. For information, please visit our website or contact the Director.

INTERACTION

ALLIANCES AND RELATIONSHIPS

As part of its mission to interact with academe and practice, UW CISA seeks to create and sustain relationships with academic units with similar objectives, professional associations and industry partners with an interest in information integrity and information systems assurance. In the coming year we will continue our outreach to units with similar goals and objectives to develop an international network for mutual support.



DISSEMINATING BEST PRACTICES

CONFERENCES

Centre personnel will make presentations at a number of conferences during 2018, including: the American Accounting Association (AAA) Auditing, AIS and SET section Midyear Meetings, the AAA Annual Meeting, the Canadian Academic Accounting Association (CAAA) Annual Conference, the International Symposium on Accounting Information Systems (ISAIS), and the European Accounting Association (EAA) Annual Conference.

COMMUNICATION

WEBSITE AND SOCIAL MEDIA OUTREACH

- › An environmental scan for 2018 will be posted on the UW CISA website in summer of 2018.
- › Various social media networks will continue to be used (Facebook, Twitter, YouTube and LinkedIn).
- › UW CISA plans to continue to improve the site in 2018, particularly for accessibility.

Your comments are welcome.

IS ASSURANCE WEBLOG

- › Malik Datardina will continue to manage the IS Assurance blog on behalf of UW CISA.

CENTRE PERSONNEL



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THANK YOU

The University of Waterloo Centre for Information Integrity and Information Systems Assurance gratefully acknowledges the generous support of our founding partners and sponsors.



UNIVERSITY OF WATERLOO
FACULTY OF ARTS
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**We welcome
inquiries, suggestions
and comments.**

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* We mourn the passing of our valued Board Member Vaike Murusalu on May 22, 2017.

UNIVERSITY OF
WATERLOO



FOR MORE INFORMATION

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