

Research Topic, Research Supervisor, Research Integrity, Research Strategy

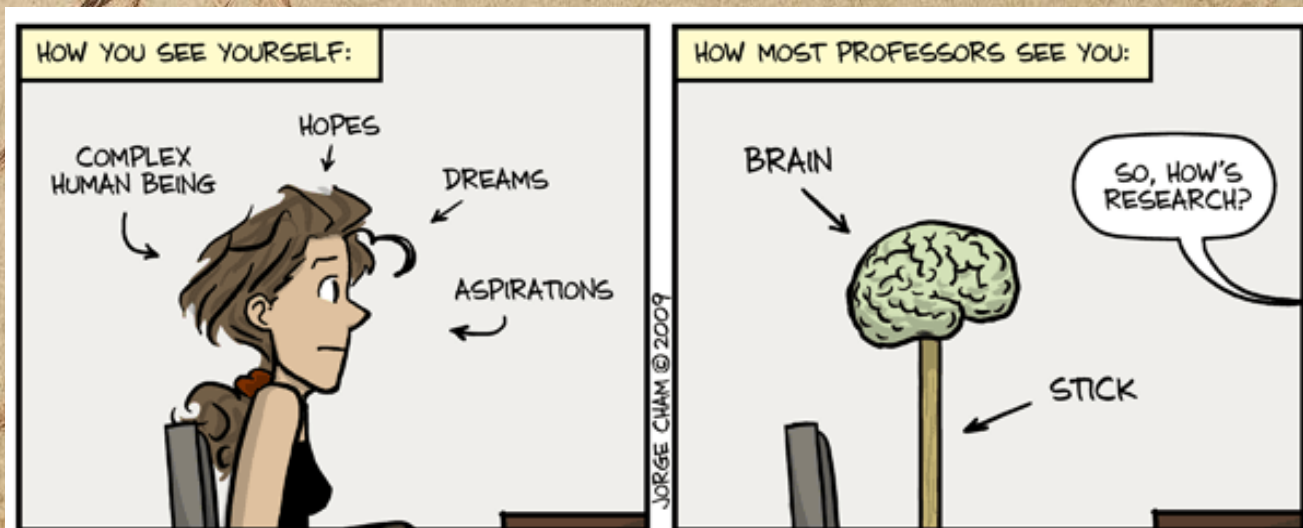
"The object of research is to extend human knowledge beyond what is already known.
An individual's knowledge enters the domain of science only after it is presented to
others in such a fashion that they can independently judge its validity"
-(NAP, "On Being a Scientist" 1995)

<http://vivek.athabascau.ca>

<https://www3.nd.edu/~pkamat/pdf/ethics.pdf>

<http://www.nap.edu/catalog/12192.html>

http://research.athabascau.ca/documents/ethics101_nov2017.pdf

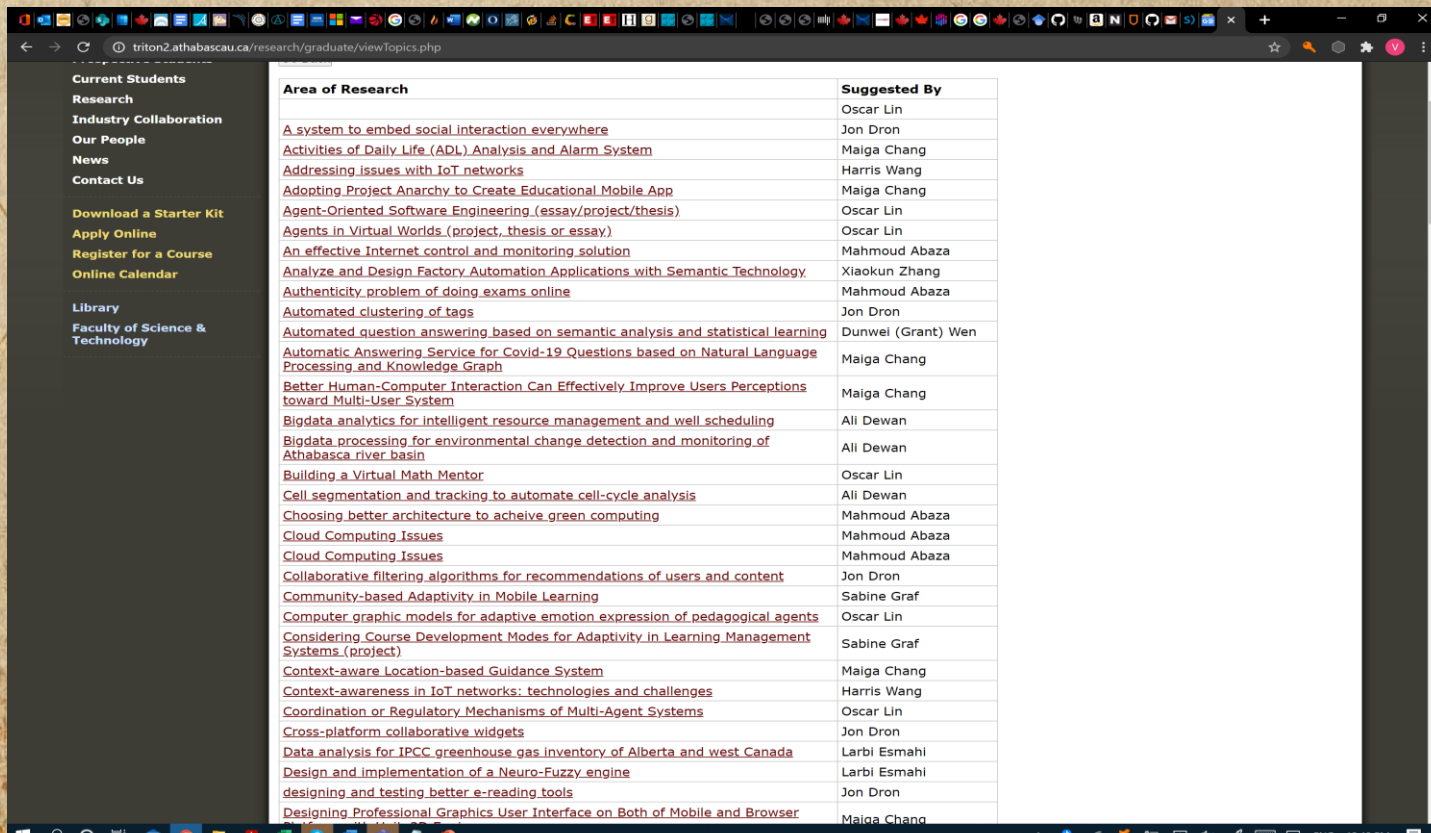


Starting your Research

✧ How to find a research topic and a supervisor?

■ <https://triton2.athabasca.ca/research/graduate/viewTopics.php>

✧ Research Plan in Comp695 – Research Methods

A screenshot of a web browser displaying the research topics page at triton2.athabasca.ca. The page has a dark sidebar on the left with navigation links like 'Current Students', 'Research', 'Industry Collaboration', etc. The main content area is divided into two columns: 'Area of Research' and 'Suggested By'. The 'Area of Research' column lists various topics, many of which are underlined. The 'Suggested By' column lists the names of the supervisors for each topic.

Area of Research	Suggested By
<u>A system to embed social interaction everywhere</u>	Oscar Lin
<u>Activities of Daily Life (ADL) Analysis and Alarm System</u>	Jon Dron
<u>Addressing issues with IoT networks</u>	Maiga Chang
<u>Adopting Project Anarchy to Create Educational Mobile App</u>	Harris Wang
<u>Agent-Oriented Software Engineering (essay/project/thesis)</u>	Maiga Chang
<u>Agents in Virtual Worlds (project, thesis or essay)</u>	Oscar Lin
<u>An effective Internet control and monitoring solution</u>	Oscar Lin
<u>Analyze and Design Factory Automation Applications with Semantic Technology</u>	Mahmoud Abaza
<u>Authenticity problem of doing exams online</u>	Xiaokun Zhang
<u>Automated clustering of tags</u>	Mahmoud Abaza
<u>Automated question answering based on semantic analysis and statistical learning</u>	Jon Dron
<u>Automatic Answering Service for Covid-19 Questions based on Natural Language Processing and Knowledge Graph</u>	Dunwei (Grant) Wen
<u>Better Human-Computer Interaction Can Effectively Improve Users Perceptions toward Multi-User System</u>	Maiga Chang
<u>Bigdata analytics for intelligent resource management and well scheduling</u>	Maiga Chang
<u>Bigdata processing for environmental change detection and monitoring of Athabasca river basin</u>	Ali Dewan
<u>Building a Virtual Math Mentor</u>	Ali Dewan
<u>Cell segmentation and tracking to automate cell-cycle analysis</u>	Oscar Lin
<u>Choosing better architecture to achieve green computing</u>	Ali Dewan
<u>Cloud Computing Issues</u>	Mahmoud Abaza
<u>Cloud Computing Issues</u>	Mahmoud Abaza
<u>Collaborative filtering algorithms for recommendations of users and content</u>	Mahmoud Abaza
<u>Community-based Adaptivity in Mobile Learning</u>	Jon Dron
<u>Computer graphic models for adaptive emotion expression of pedagogical agents</u>	Sabine Graf
<u>Considering Course Development Modes for Adaptivity in Learning Management Systems (project)</u>	Oscar Lin
<u>Context-aware Location-based Guidance System</u>	Sabine Graf
<u>Context-awareness in IoT networks: technologies and challenges</u>	Maiga Chang
<u>Coordination or Regulatory Mechanisms of Multi-Agent Systems</u>	Harris Wang
<u>Cross-platform collaborative widgets</u>	Oscar Lin
<u>Data analysis for IPCC greenhouse gas inventory of Alberta and west Canada</u>	Jon Dron
<u>Design and implementation of a Neuro-Fuzzy engine</u>	Larbi Esmahi
<u>designing and testing better e-reading tools</u>	Larbi Esmahi
<u>Designing Professional Graphics User Interface on Both of Mobile and Browser</u>	Jon Dron
	Maiga Chang

IP rights

- ✧ http://fgs.athabascau.ca/docs/Intellectual_Property.pdf offers an excellent introduction to IP, copyright, patent ...
 - Administrative and Operational Activities - AU
 - Teaching and Learning Responsibilities - AU
 - Academic Research Activities – Creator & AU
 - External Research Activities – Creator

- ✧ <http://ous.athabascau.ca/policy/#POI> points to AU's IP policy
 - Discuss IP expectations at the beginning of graduate student/supervisor relationship
 - Draft an agreement and revisit when required

http://www.cags.ca/documents/publications/best_practices/Letterofunderstanding.FINALOCT2012.Eng.doc

Authorship

- Policies at most scientific journals state that a person should be listed as the author of a **paper only if that person made a direct and substantial intellectual contribution** to the design of the research, the interpretation of the data, or the drafting of the paper.
- The acknowledgments section can be used to thank those who indirectly contributed to the work.



(From ORI
<http://ori.dhhs.gov/education/products/RCRintro/c02/0c2.html>)

What is publishable?

- Papers that report “**original and significant**” findings that are likely to be of interest to a broad spectrum of its readers
- Papers that are **well organized and well written**, with clear statements regarding how the findings relate to and advance the understanding/development of the subject

Research Misconduct

Research misconduct means **Fabrication, Falsification, or Plagiarism** in proposing, performing, or reviewing research, or in reporting research results.

- (a) **Fabrication** is making up data or results and recording or reporting them.
- (b) **Falsification** is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.
- (c) **Plagiarism** is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.
Self-Plagiarism
- (d) Research misconduct does not include honest error or differences of opinion.



Data Ownership



It is your fundamental obligation to create and maintain an accurate, accessible, and permanent record of data. Funding agencies now require you to store the data for longer periods.

New national Research Data Management procedures and policies are upcoming (e.g., NDRIO)

Record and Share sufficient detail for others to check and replicate the work. Open Data? Open Science? Open Research?

<https://osf.io/fxvru/>

Who owns research data?

(From ORI
<http://ori.dhhs.gov/education/products/RCRintro/c02/0c2.html>)

52.1MB

Public

0

...

Frontiers In Education 2020 - Explainable Automated Essay Scoring: Deep Learning Really Has Pedagogical Value

Contributors: [Vivekanandan Suresh Kumar](#), [David Boulanger](#)

Date created: 2020-06-13 07:23 PM | Last Updated: 2020-10-06 04:45 AM

Category:  Project

Description: Automated essay scoring (AES) is a compelling topic in Learning Analytics for the primary reason that recent advances in AI find it as a good testbed to explore artificial supplementation of human creativity. However, a vast swath of research tackles AES only holistically; few have even developed AES models at the rubric level, the very first layer of explanation underlying the prediction of holistic scores. Consequently, the AES black box has remained impenetrable. Although several algorithms from Explainable Artificial Intelligence have recently been published, no research has yet investigated the role that these explanation models can play in: (a) discovering the decision-making process that drives AES, (b) fine-tuning predictive models to improve generalizability and interpretability, and (c) providing personalized, formative, and fine-grained feedback to students during the writing process. Building on previous studies where models were trained to predict both the holistic and rubric scores of essays, using the Automated Student Assessment Prize's essay datasets, this study focuses on predicting the quality of the writing style of Grade-7 essays and exposes the decision processes that lead to these predictions. In doing so, it evaluates the impact of deep learning (multi-layer perceptron neural networks) on the performance of AES. It has been found that the effect of deep learning can be best viewed when assessing the trustworthiness of explanation models. As more hidden layers were added to the neural network, the descriptive accuracy increased by about 10%. This study shows that faster (up to three orders of magnitude) SHAP implementations are as accurate as the slower model-agnostic one. It leverages the state-of-the-art in natural language processing, applying feature selection on a pool of 1592 linguistic indices that measure aspects of text cohesion, lexical diversity, lexical sophistication, and syntactic sophistication and complexity. In addition to the list of most globally important features, this study reports (a) a list of features that are important for a specific essay (locally), (b) a range of values for each feature that contribute to higher or lower rubric scores, and (c) a model that allows to quantify the impact of the implementation of formative feedback.

Files



Name ^ v

Modified ^ v

 Frontiers In Education 2020 - Explainable Automated Essay Scoring: ... OSF Storage (Canada - Montréal) code data models ASAP-D7 + SALAT SALAT

Citation

APA

Kumar, V., & Boulanger, D. (2020, October 6). Frontiers In Education 2020 - Explainable Automated Essay Scoring: Deep Learning Really Has Pedagogical Value. Retrieved from osf.io/fxvru

MLA

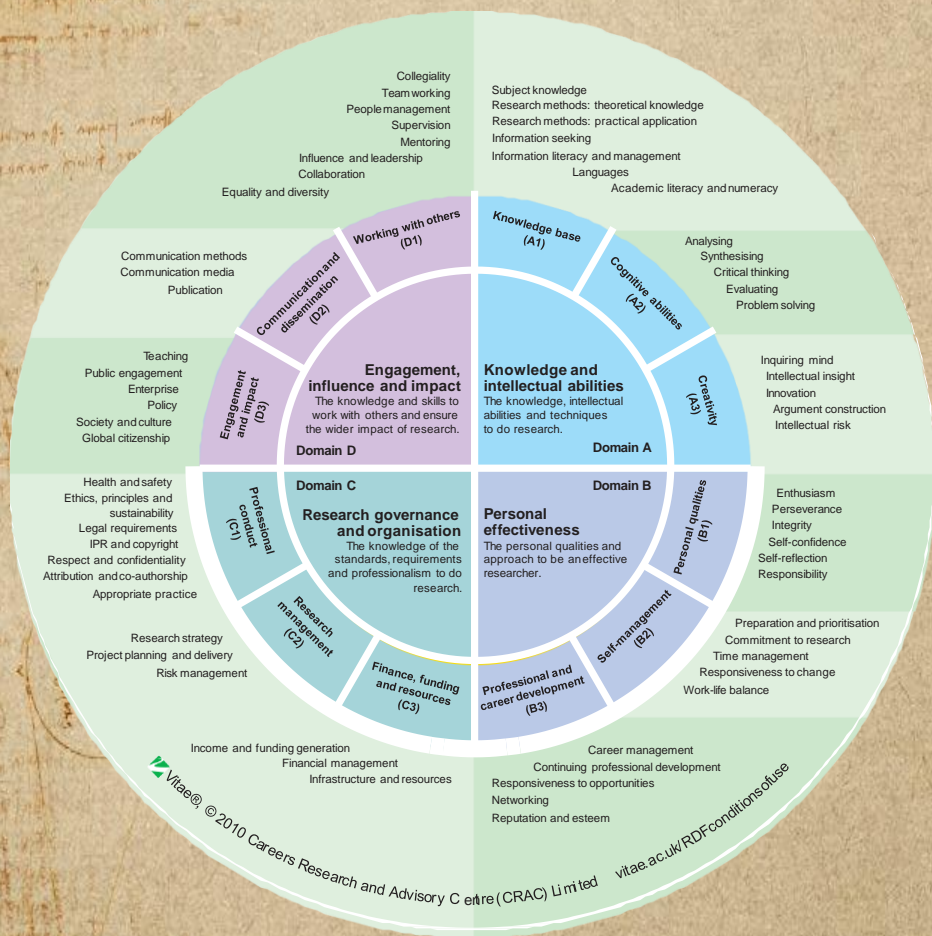
Kumar, Vivekanandan, and David Boulanger. "Frontiers In Education 2020 - Explainable Automated Essay Scoring: Deep Learning Really Has Pedagogical Value." OSF, 6 Oct. 2020. Web.

Chicago

Kumar, Vivekanandan, and David Boulanger. 2020. "Frontiers In Education 2020 - Explainable Automated Essay Scoring: Deep Learning Really Has Pedagogical Value." OSF, October 6. osf.io/fxvru.

Get more citations

Strategic Research – VITAE + MAHARA



Shun predatory journals and conferences

Shun plagiarism (TurnItIn, HelioBLAST)

Be on the edge of the research frontier

Be thorough with your research methods

Be ethically clean

Be open