

# Jim Morey

## 1. Academic Credentials

- University of Western Ontario, London, Ontario, Canada. Ph.D. Computer Science, 2005
- University of British Columbia, British Columbia, Canada. M.Sc. Mathematics, 1995
- University of Guelph, Guelph, Ontario, Canada. H.B.Sc. Mathematics, 1993

## 2. Publications

### 2.1 Books & Chapters

- [1] Gammack, J, **Morey**, J (2016). *Innovative reading support for non-native readers of University digital texts*. In Bidal, J, Doman, E (ed.), *Departing from Tradition: Innovations in English Language Teaching and Learning*. Cambridge Scholars Publishing, pp. 128-145.
- [2] Sedig, K, **Morey**, J (2005). *A Descriptive Framework for Designing Interaction for Visual Abstractions*. In G. Malcolm (ed.), *Multidisciplinary Approaches To Visual Representations And Interpretations* G. Malcolm, Elsevier Science & Technology, pp. 239-254.
- [3] Sedig, K, **Morey**, J, Mercer, R, Wilson, W (2005). *Visualizing, Interacting and Experimenting with Lattices Using a Diagrammatic Representation*. In G. Malcolm (ed.), *Multidisciplinary Approaches To Visual Representations And Interpretations*, Elsevier Science & Technology, pp. 255-278.
- [4] **Morey**, J (2004). *Designing Visually Rich Mathematical Investigation tools for Repetitive Geometric Artifacts*. University of Western Ontario, **Ph.D. Thesis**.
- [5] **Morey**, J, Sedig, K (2004). *Archimedean Kaleidoscope: A cognitive tool to support thinking and reasoning about geometric solids*. In M. Sarfraz (ed.), *Geometric Modeling: Techniques, Applications, Systems and Tools*. Kluwer Academic Publisher, pp. 376-393.
- [6] **Morey**, J (1996). *Advanced Graphics: Multimedia*. Web Programming with Java. Girdley M, Jones K. A., et al. Sams Publishing; Indianapolis, U.S.A.
- [7] **Morey**, J (1996). *Serious Play: Game Applets*. Web Programming with Java. Girdley M, Jones K. A., et al. Sams Publishing; Indianapolis, U.S.A.

### 2.2 Journal Articles

- [8] **Morey**, J, Gammack, J. (2016). *Designing an Interactive Visualization to Explore Eye-movement Data*. The Review of Socionetwork Strategies 10 (2), pp.73-89.
- [9] Sedig, Kamran & Parsons, Paul & Liang, Hai-Ning & **Morey**, Jim. (2016). *Supporting Sensemaking of Complex Objects with Visualizations: Visibility and Complementarity of Interactions*. Informatics. 4. 10.3390/informatics3040020.
- [10] Smith, G, **Morey**, J, Tjoe, E. (2007). *Feature Masking in Computer Game Promotes Visual Imagery*. Journal of Educational Computing Research, Baywood. Vol 36, Issue 3, pp. 351-372.
- [11] **Morey**, J (2006). *Programming in PolygonR&D: Explorations with a Spatial Language*. International Journal of Computers for Mathematical Learning, Springer-Verlag. 11(2), 147-175
- [12] **Morey**, J, Sedig, K (2004). *Adjusting degree of visual complexity: An interactive approach for exploring four-dimensional polytopes*. The Visual Computer: International Journal of Computer Graphics, Springer-Verlag. 20(8-9): 565-585.
- [13] Sedig, K, Rowhani, S, **Morey**, J, Liang, H (2003). *Application of information visualization techniques to the design of a mathematical mindtool: A usability study*. Journal Information Visualization. 2(3): 142-160.

## 2.3 Conference Papers

- [14] **Morey**, J, Gammack, J, Thornquist, E. (2016). *Gamifying Foundational STEM Skills*. Computer Science and Engineering (APWC on CSE), 2016 3rd Asia-Pacific World Congress.
- [15] **Morey**, J, Gammack, J. (2015). *A data visualisation for horizontal eye-movements*. Computer Science and Engineering (APWC on CSE), 2015 2nd Asia-Pacific World Congress.
- [16] **Morey**, J, Gammack, J, Thornquist, E. (2015). *Interface development for a gaze-controlled reading support application*. Information and Communication Technology Research (ICTRC), pp. 214-217.
- [17] Liang, HN, Fleming, C, **Morey**, J, Sedig, K, Man, KL. (2013) *Students' perception on the use of visual tilings to support their learning of programming concepts*. Teaching, Assessment and Learning for Engineering (TALE), IEEE, pp. 121-126.
- [18] Liang, HN, **Morey**, J, Sedig, K. (2012) *Using visual tiling patterns to support the teaching of programming concepts*. Teaching, Assessment and Learning for Engineering (TALE), IEEE, W1B-5-W1B-10.
- [19] **Morey**, J (2010). *Piecing Together Programs: Navigating Between Low-Level Instructions, Subroutines, and Programs*. EdMedia: World Conference on Educational Media and Technology, pp. 3423-3428.
- [20] Sedig, K, Liang, HN, **Morey**, J. (2009) *Enhancing the usability of complex visualizations by making them interactive: A study*. EdMedia: World Conference on Educational Media and Technology, pp. 1021-1029.
- [21] **Morey**, J (2007). *Linking Tilings to Algorithms: An Approach for Introducing Programming Concepts*. EdMedia: World Conference on Educational Media and Technology, pp. 2947-2950.
- [22] **Morey**, J (2005). *Representing Rolling Sequences of Polyhedra to Support Mathematics Comprehension*. ED-MEDIA 2005: World Conference on Educational Multimedia and Hypermedia, Montreal, Canada, Vol. 2005, Issue 1, pp. 1279-1283.
- [23] **Morey**, J, Sedig, K (2004). *Using indexed-sequential geometric glyphs to explore visual patterns*. Proceedings of Interactive Visualisation and Interaction Technologies, ICCS 2004, Krakow, Poland, June 2004, pp. 996-1003.
- [24] **Morey**, J, Sedig, K, Mercer, R (2003). *Polyvise: A tool for exploring four-dimensional uniform polytopes*. Proceedings of the IASTED International Conference in Computer Graphics and Imaging, Hawaii, pp. 181-186.
- [25] Sedig, K, **Morey**, J(2002). *Facilitating Learning Through Different Forms of Interaction With Visual Abstractions*. Proceedings of ED-MEDIA 2002: World Conference on Educational Multimedia and Hypermedia, Denver, USA, Vol. 2002, Issue 1, pp. 1776-1777.
- [26] Sedig, K, **Morey**, J, Chu, B (2002). *TileLand: A Microworld for Creating Mathematical Art*. Proceedings of ED-MEDIA 2002: World Conference on Educational Multimedia and Hypermedia, Denver, USA, Vol. 2002, Issue 1, pp. 1778-1783.
- [27] **Morey**, J, Sedig, K, Mercer, R, Wilson, W (2002). *Crystal Lattice Automata*. In Proceedings of the Sixth International Conference on Implementations and Applications of Automata (Pretoria, South Africa, July 2001), Lecture Notes in Computer Science, Springer Verlag, pp. 214-220.
- [28] **Morey**, J, Sedig, K, Mercer, R (2001). *Interactive Metamorphic Visuals: Exploring Polyhedral Relationships*. IEEE Information Visualization Conference, London, UK, pp. 483-488.

[google scholar](#)

## 3. Positions

Assistant Professor	2013-2017	College of Technological Innovation Zayed University, Abu Dhabi, UAE
Assistant Professor	2011-2013	Department of Mathematics Zayed University, Abu Dhabi, UAE
Assistant Professor	2005-2009	Department of Mathematics and Computer Science Wesleyan College, GA, USA
Lecturer	1998, 2002, 2004	Department of Computer Science University of Western Ontario
Teaching Assistant	2001-2002	Department of Mathematics University of Western Ontario
Palm Pilot	2000, 2001	Lawson Diabetes Centre

Programmer		Mount St. Joseph London
Research Assistant	1997-2004	Department of Computer Science University of Western Ontario
Teaching Assistant	1997-2001	Department of Computer Science University of Western Ontario
Java Consultant	1997	Electronic Games for Education in Math and Science(EGEMS) Department of Computer Science University of British Columbia
Teaching Assistant	1993-1995	Department of Mathematics University of British Columbia
Teaching Assistant	1991-1993	Department of Mathematics University of Guelph
Programmer System Designer	1988-1993	Canadian Centre for Creative Technology Waterloo

## 4. Teaching

2013-2017 Zayed CTI	Mobile Computing (CIT371), Multimedia Systems (CIT345), Human Computer Interactions (CIT375), Game Development (CIT376), Introduction to Programming (CIT225) {Java}, Introduction to Programming (CIT225){Javascript}
2011-2013 Zayed Math	Introduction to Information Technology (COL270), Mathematical Modeling with Functions(COL111), Mathematical Modeling with Data (COL110), Basic Mathematics (MAT101)
2005-2009 Wesleyan	Operating Systems (CIS311), Special Topics:Web 2.0(CS396), Special Topics:Computer Simulations(CS396), Programming Languages II (CS218){Java}, Programming Languages I (CS216) {Java}, Quantitative Reasoning (MAT108), Linear Algebra (MAT210), Introduction to Mathematical Reasoning (MAT192), Geometry (MAT175), Precalculus (MAT140), Discrete Mathematics (MAT200), College Algebra (MAT130)
1998-2004 Western	Computer Science Fundamentals II (CS027){Java}

## 5. Committees

2013-2017 Zayed CTI	Academic integrity committee, Multimedia curriculum committee, Web Content Committee, Teaching & learning / EdTech Committee, Multimedia search committee
2011-2013 Zayed Math	University College Faculty Affairs Committee, Math Hiring Committee, iPad Integration Task Force, Technology & Blended Learning Committee
2005-2009 Wesleyan	Programs and Exhibitions, Title III Task Force, Library and Instructional Technology, Teacher Education Committee
1997-2005 Western	Programme Committee for International Conference on Coordinated & Multiple Views in Exploratory Visualization 2005, Appointments, Promotion, and Tenure (Student Representative), Resource Planning Committee , Graduate Union Steward, Society of Graduate Students (Councillor)

## 6. Web Presence

- [polygoncraze](#) — my blog about geometry related topics
- [theamatour](#) — my youtube videos, which mainly consists of constructing geometric artifacts like balloon structures (with more than a million total views)
- [coderesources](#) — a wiki for storing, and sharing teaching resources
- [jimmorey.com](#) — my web site that I use to dumping spot
  - new web prototypes:
    - an updated [tileland](#)
    - an [eyetracking reading app](#) and it's associated visualizer [HEMP](#)
    - [bullseye](#) — a geometric skill game for factoring (or [Spanish language bulleye](#))
    - a [3D version 2048](#)
  - old Java prototypes: [Polyvise](#), [PolygonRnD](#), [3DLatticeViewer](#), [Tileland](#), [Archimedean Confection](#), and [Archimedean Kaleidoscope](#)
  - course resources: an [individualized assignment generator](#) or [quizzes](#)
  - arbitrary links

## 7. Research Statement

### General Area

There are many expanding areas in human computer interactions that push the boundaries of the relationships between people and software. The promise of better understanding data through interactive presentations drives many researchers to study information visualization, representation, and interaction. One direction is to utilize people's tacit understanding of space to aid in their understanding other domains. In geometry, there was much initial interest in exploiting visualization to aid in research (for instance at *The Geometry Center*). Although there is still interest in this direction, more energy has recently been spent exploring the educational, or introductory, benefits of visualization and interaction in geometry.

### Specific Area

My interests have to do with investigating interactive spatial representations of abstract knowledge for use with introductory learning tools. Complex relationships can be suggested among visual components in the spatial domain as noted in Tufte's books about illustrations. With the dimension of interaction, the spatial properties of visuals can encode subtle causal relationships as demonstrated in many of the examples that are considered part of the dynamic geometry movement.

### Research Summary

My work has focused on tools for exploring and understanding patterns. These patterns are spatially represented and encoded in geometric structures such as tilings, polyhedra, lattices (also referred to as nets), and polytopes. Although geometry is the context, the focus is on the patterns and their regularity. The spatial regularity of the structures lends itself to algorithmic descriptions that can be represented computationally with automata and Turing machines. The interfaces for the tools integrate the multiple representations with the goal of introducing the abstract complexities associated with the structures. A number of interactions that I designed for specific structures were extended to general exploration techniques. Two of the more notable techniques are stacking-unstacking (a continuous technique for exploring spatial regularities in structures) and focus+scoping (a technique for locally exploring complex structure). Generally, these interactive techniques and the representations incorporated in the tools provide a rich platform from which many user studies have and will be performed to help understand the importance of elements and designs for visually rich investigation tools.

## Future Plans

I plan to further my studies of introductory tools, which rely on tacit spatial knowledge. Sophisticated introductions can use progressions of interface elements that are either part of a foundation (persistent in the progression) or part of a scaffold (transient in the progression). In particular, I would like to run user studies to investigate the effects of interface progressions. I believe that the spatial environment of PolygonR&D provides an excellent testbed for experimentation with interface progressions. In this environment, geometry is used for programming (in Logo, programming is used for geometry), which induces a visual representation for computational structures. The abundance of spatial and visual elements admit many paths of progression for introducing complex material. More broadly, I would like to study: spatial ways of programming, visual explorations of algorithms, and techniques to bridge the gulf of between processing and computational results.

## 8. Teaching Philosophy

### Courses

I believe teaching a course is a complex task that admits many successful strategies. A strategy's level of success will depend on the particular situation and environment in which it is employed. This dependence, if not carefully considered, can make concrete discussions comparing teaching styles seem perplexing and contradictory. Ultimately, I believe that learning is a function of time spent engaged with course material, which means that successful teaching strategies somehow capture students' interest and encourage them to focus their attention on essential course material. In courses I have taught, I have focused on two aspects: motivation and skills. To help students connect with a topic, I try to demonstrate a strong motivation for learning it, which often communicates central perspectives of the discipline. To help students focus their efforts, I try to highlight and label important skills that can act as a concise means of viewing the courses in terms of concrete, achievable milestones. A focus on these aspects has helped me employ different approaches to course material; a focus on motivation helps a top-down approach, and a focus on skills helps a bottom-up approach. A top-down approach tends to present the course as a transformative experience that offers the potential to change the student's perspective. A bottom-up approach tends to present the course as an information package that contains many skills to be acquired. I believe that balancing these approaches is useful in helping students achieve a deep and detailed understanding of the course.

### Assignments

Computer science seems to offer a perfect context for exploring complex, abstract concepts in a concrete manner. Often, abstractions are required to study and understand concrete computer examples. I see assignments as an excellent way for students to gain experience with course skills and have opportunities for directed reflection on subtleties of the material. It is a challenging task to construct well balanced assignments that provide basic experience, yet encourage and promote sophisticated and course related thoughts. When I construct assignments, my goal is to provide strong motivation while covering the required skills. I try to impress upon my students the importance of assignments with Confucius' quote, "I hear I forget, I see I remember, I do I understand".

### Lectures

My on-going interest in teaching parallels my research interest of constructing and studying computer learning environments as well as my personal interest in performing. As a designer of learning environments, I try to conceptually streamline tools so users do not become distracted or confused by details that may not contribute to my goals for the tool. This streamlining can sometimes mean sacrificing pet interests that are not essential. My past years as an improv actor in dinner theatre, I have been honing my on-the-fly presentation skills to listen to and steer my audiences so that their interactions and interjections enhance and become part of a coherent play. I believe that both of these interests contribute to the way I view teaching as a carefully pruned activity, as well as, a flexible and inclusive activity.

<http://jimmorey.com/cv.html>