

Dr Joseph Angus Corneli

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Degrees

PhD, The Open University (Computing), 2014
BA, New College of Florida (Mathematics), 2002

Experience

School of Informatics, University of Edinburgh Research Associate, 2017, current position

Developing a computable model of “The Social Machine of Mathematics” (EP/K040251/1) with Professor Ursula Martin (Oxford) and colleagues at the University of Edinburgh and University of Dundee. I have been invited to help develop and teach a new course “Data Science for Design” at the Edinburgh College of Art which we are preparing for a September start. I will also participate in the Oxford Summer School in Economic Networks, the Isaac Newton Institute (Cambridge) Summer Meeting on Big Proof, and meetings of the SOCIAM consortium (EP/J017728/1). One early output will be presented at the 2017 Conference on Intelligent Computer Mathematics.

Goldsmiths College, University of London Researcher in Computational Creativity, 2013-2017

Carried out research on social creativity in the EU project COINVENT (611553) and coordinated consortium-wide evaluation activities. I wrote Clojure code that interoperates with an existing Java codebase to develop a new framework for automatic program synthesis, using the new clojure.spec package to expose APIs for functional programs. I contributed to dissemination with numerous publications, including a paper for the top-rated journal *Artificial Intelligence*. I also consolidated ideas for future work in a grant proposal, supported by the EPSRC-funded Platform grant “The Integration and Interaction of Multiple Mathematical Reasoning Processes” (EP/N014758/1).

The Peeragogy Project Editor, 2012-2015

Inspired by one of the papers that came out of my doctoral research, Howard Rheingold (Stanford) convened the Peeragogy project, inviting both local and remote participation. I joined the project and led development of the *Peeragogy Handbook* (now in a 3rd Edition, with over 30 global contributors) and other publications, including a design pattern catalogue published at the Pattern Languages of Programs Conference. Peeragogy is a collection of practical techniques for collaborative learning and collaborative work.

The Open University Research Student, 2010-2014 *Doctor of Philosophy (Computing)*, 2014

Thesis: *Peer produced peer learning: A mathematics case study*

I made a case for learning mathematics the same way learning works in free/libre/open source software. My argument was supported by (1) statistical analysis of a decade of interaction data from PlanetMath.org that showed how social factors contribute to learning outcomes; and (2) user studies in a public deployment of a new software system. I worked with Professor Michael Kohlhase (Jacobs University, Bremen) and his students to develop the system (I contributed 637 of 1124 total code commits). A prototype was selected as finalist in Elsevier’s Executable Paper Challenge. I was supported financially by the Reusable Open Learning Environment (ROLE) FP7-ICT project (231396), and published in venues including the Open Knowledge Conference and *E-Learning and Digital Media*.

Knowledge Media Institute at The Open University Research Assistant, 2013

Carried out PHP (Drupal) and Common Lisp programming in an EU FP7-ICT collaborative project on digital heritage, DECIPHER (270001). I helped build and evaluate web-based tools for museum professionals: specifically, an up-to-date Semantic Web model of a complex Drupal website and textual summaries of recommendations derived from this model. I contributed to an applications paper in the Conference on Interactive Digital Storytelling.

Peer-2-Peer University Course Facilitator, 2010-2011

Designed and facilitated several six-week online courses: “DIY Math”; “Mathematics for Game Designers”; “Open Governance and Learning” co-organized with Marisa Ponti (Gothenburg); and “Shaping P2PU”. A post-mortem analysis of “DIY Math” and other participant observation experiences informed a publication that proposed a new theory of “peer produced peer learning.” This work was initially published at the Open Knowledge Conference and informed my PhD thesis and the Peeragogy project.

PlanetMath.org, Ltd. Research Affiliate 2004-2008; Co-Director, 2008-ongoing

PlanetMath was one of the first crowdsourced online encyclopedias. I contributed to strategic planning, research, design, programming, and technical editing, and also represented the organisation at national and international conferences and workshops (e.g., AMS/MAA Joint Mathematics Meetings). I presented software demos at LISP NYC and Emory University, and supervised two Google Summer of Code internships. Research experience approximately equivalent to a Master’s degree in Computing set the stage for my Open University PhD thesis.

Bristol Place Corporation Resource Counsellor, 2005-2008

I provided supervision and guidance in a secure residential facility for men with intellectual disabilities and mental illness. I received extensive training for this role. Responsibilities included working on person-centred plans that helped clients achieve as much independence as possible, and safe, constructive, interaction during crisis situations.

Academic Tutoring & Testing, Inc. Tutor, 2005

Private one-on-one tutoring for Calculus and Precalculus, leading to student success on the SAT Subject Test.

University of Texas at Austin Research Assistant and Postgraduate Student, 2002-2004

Completed graduate-level coursework in mathematics, statistics, and computer science. In a course on Knowledge Representation and Reasoning, I began developing a strategy for representing mathematics in LISP. I left this position to develop these ideas in collaboration with members of the PlanetMath project. My subsequent postdoctoral research continues to build on these themes.

Cycorp, Inc. Associate Member of the Technical Staff, 2003

Devised and implemented methods to clean a large artificial intelligence knowledge base. Carried out programming in LISP and knowledge representation work in CycL.

Department of Mathematics, the University of Texas at Austin Teaching Assistant, 2003

Facilitated weekly problem sessions, graded papers, and held office hours for Calculus I. Periodically filled in for the instructor delivering full-class lectures in case of illness.

New College of Florida Undergraduate Student, 1998-2002 *Bachelor of Arts (Mathematics)*, 2002

Thesis: *Double bubbles in spaces of constant curvature*

Four year full-time honours degree, complemented by two summers as a paid Research Assistant (National Science Foundation Research Experiences for Undergraduates) at the University of Washington (2000) and Williams College (2001), a Clay Institute Summer School (2001), and a term as a visiting student at MIT (Autumn 2001). My thesis presented new results describing the features of optimal solutions to a class of constraint-satisfaction problems in modern geometry. This research led to several journal publications, and an overview also appears in Frank Morgan’s *Geometric Measure Theory: A Beginner’s Guide* (4th Ed.).

University of Minnesota Post-Secondary Enrollment Options Student, 1996-1998

Enrolled full-time at the University of Minnesota during my last two years of high school. Completed honours-level coursework in mathematics, anthropology, art, and literature. Assisted Professor Luther Gerlach (Anthropology) with his web pages and joined in fieldwork activities studying resource management in the Minnesota River Valley.

Research strategy

Overview

Motivations and themes. My early research examined the geometry of efficient surfaces: abstract models of soap bubble clusters (*Journals 1, 2, 3, 4*). This work inspired me to think more broadly about what D’Arcy Thompson referred to as “growth and form.” I turned these reflections in a metamathematical direction, and asked: how does new mathematics come to be? My doctoral research developed a strategy for improving the way existing mathematical knowledge is taught, learned, and used (*Journals 5*). My postdoctoral work has studied “social creativity” in mathematics and other domains through simulation and formal models (*Journals 6*). Computer-mediated communication (CMC) and artificial intelligence (AI) are my primary disciplinary affiliations. In the next phase of my career I will focus on building a new generation of knowledge-rich intelligent tutoring systems and interactive tools for professional mathematicians and programmers.

Key accomplishments.

- The software system, Planetary, on which I led development, was selected as a finalist in Elsevier’s Executable Paper Challenge and deployed on a popular mathematics website (*Conferences 6*).
- I took the leadership role in developing a theory of the co-evolution of peer learning and peer production in online communities, and edited a book on this subject (*Unrefereed 3*).
- A joint paper recently accepted at the top-rated journal “Artificial Intelligence” realises, at a high level, my earlier ambition to build a system that models the way new mathematics develops – in this case by using methods from argumentation theory (*Journals 6*).

Directions for future work

1. **Detailed models of defeasible argument in mathematics** → “Argumentation” (*Work in progress 3*).
2. **Knowledge extraction from online texts and dialogues** → EPSRC responsive mode (*Grants 3*).
3. **Automatic program and proof synthesis** → collaboration with Anna Jordanous at University of Kent.
4. **AI in society** → “Digital Creativity” (*Work in progress 1*), “ACM Computing Surveys” (*Work in progress 2*), and “Artificial Intelligence” (*Work in progress 4*).

An overall hypothesis connects these: When (1) *semantic models of technical content and process* relevant to learning and research are sufficiently (2) *thorough, well-populated, and representative* at relevant levels and (3) *actionable* in pedagogically/epistemologically useful ways, then it will be possible to (4) *employ computers within educational and research communities to generate learning pathways, stories, proofs, and programs that are meaningfully responsive to the needs and interests of users* as measured by performance on standard assessments.

Strategy to secure research funding

My doctoral thesis asserts: “Rather than viewing Wikipedia, math.stackexchange.com, and MathOverflow as competitors, they could be seen as potential collaborators and contributors to the same commons resource[.]” Simple interventions, like a plugin that interconnects Wikipedia articles and Stack Exchange questions, could be studied within EPSRC’s First Grant scheme. The overall hypothesis above fits broadly within the theme of “Human-like computing” discussed in an EPSRC workshop, held in February, 2016. Participants stated: “Education is a good application area as it touches on so many human issues.” An investigation of “next-generation” intelligent tutoring could be a good topic for interdisciplinary collaborations and consortia, in which my work with knowledge representation and reasoning would play a central role. In parallel I plan to develop a series of tightly focused technical proposals – or a fellowship – dealing with modelling knowledge and workflows on Stack Exchange, Wikipedia, Github, and Arxiv.

Teaching statement

Overview

- **I am jointly developing a Master's-level course, Data Science for Design, which I will co-teach from September 2017 in the Informatics Design programme at the University of Edinburgh.** This course will give a solid grounding in programming, data management, analysis, and visualisation to design students, many of whom have never programmed before. Learning outcomes also address communication about socially relevant issues and professional collaborative practices. Formative feedback will be provided in weekly tutorials and with written remarks on preliminary outputs (one on data we provide, one on student-selected data). A final group report will involve analysis and reporting on a social problem identified by the group; summative feedback provided at the end of the course will reflect marks earned on the three assignments and for participation.
- **I am currently co-supervising an MSc student in Informatics at the University of Edinburgh.** She has proposed a project on “Importing mathematics formulas from Wikipedia to Wikidata”, in response to a theme “Mathematics and Wikidata” that I developed with Dr Alan Smaill. The plan is to use machine learning methods for text analysis. This project is slated to run June to August 2017.
- **In 2010 and 2011, I designed and delivered four six-week online courses at the Peer-2-Peer University (P2PU), a Hewlett- and Shuttleworth-funded not-for-profit.** The courses were DIY Math, Mathematics for Game Designers, Open Learning and Governance, and Shaping P2PU. Reflections on this experience formed the basis of a joint publication, which in turn informed the development of the international participatory research project on “Peeragogy” (peer teaching and learning) convened by Howard Rheingold.

Philosophy

The recent example of Data Science for Design highlights my enthusiasm for helping students develop the range of skills required to effectively engage with real-world problems. I agree with anthropologist Tim Ingold that students should be brought into the “power-house” of knowledge construction – and that teaching is an opportunity to study with students, rather than simply to transmit knowledge. At the same time, I am aware of the necessity of supporting students as they tackle learning-appropriate challenges.

I know from personal experience that strong students, with suitable support, can be productively involved in original research even from a young age. My early journal papers came out of student research at Williams College, where I returned two years later as a mentor. I have other experiences in a supportive role. I was trained to manage high-intensity interpersonal situations and to support developmental learning when I worked as a Resource Counsellor in a secure residential facility for men with mental illness and developmental disabilities. I have also worked as a volunteer and paid mathematics tutor, and as a teaching assistant. In my work with PlanetMath, I supervised two programming projects as part of Google Summer of Code (2006 and 2007). I enjoy working with diverse populations.

My doctoral and postdoctoral research into online “social machines” carries over to the design of effective offline learning practices and strategies. For example, colleagues have found that computational creativity gets undergraduate students excited about programming. This finding could be understood using one of the publications coming out of the Peeragogy project: a design pattern catalogue published at the Pattern Languages of Programs conference (PLoP). The paper described patterns that are relevant to the design of effective learning environments and collaborative workflows. It suggests that students who think together about what it means to be creative are better able to come up with actionable roadmaps for their programming projects. As a PLoP participant, I also learned strategies for paper shepherding and running Writers Workshops. I have used these methods to help PhD students in the EPSRC Centre for Doctoral Training in Intelligent Games & Game Intelligence (IGGI) develop their research and writing.

Summary of best publications

I include the Computing Research and Education Association of Australasia's (CORE) rankings where available. An A* journal is in the "top 7%" of journals. An A conference is "highly respected in a discipline area."

A. Pease, J. Lawrence, K. Budzynska, J. Corneli, and C. Reed. **Lakatos-style Collaborative Mathematics through Dialectical, Structured and Abstract Argumentation**. In: *Artificial Intelligence* 246 (2017), pp. 181–219. **CORE: A***.

Originality: This is the first time that formally specified and fully implemented argumentation tools have been brought together and applied to a specific, demanding, domain of human reasoning.

Significance: This work provides part of the foundation for a computable theory of mathematical creativity.

Rigour: We interpret the informal logic of mathematical discovery proposed by Imre Lakatos as a formal dialogue game ranging over structures of argumentation. The paper describes both theory and implementation, and we show (in an appendix) that the model is descriptive of real-world examples of mathematical dialogues.

M. Kohlhase, J. Corneli, C. David, D. Ginev, C. Jucovschi, A. Kohlhase, C. Lange, B. Matican, S. Mirea, and V. Zholudev. **The Planetary System: Web 3.0 & Active Documents for STEM**. In: *Procedia Computer Science* 4 (2011). Proceedings of the International Conference on Computational Science, ICCS 2011, pp. 598–607. **CORE: A; Google Scholar citations: 51**.

Originality: The Planetary system is a customised content management system (CMS) that supports fluid interaction with mathematical texts, incorporating modern technologies (e.g., MathML, Javascript, Web Sockets, RDFa).

Significance: This paper describes a prototype system that was selected as a finalist in Elsevier's Executable Paper Challenge. The system was designed to support modular extension and multiple configurations.

Rigour: The system has been successfully deployed as the backend for a crowdsourced mathematics encyclopedia, PlanetMath, and as a tool to host lecture notes and discussions for computer science courses at Jacobs University.

J. Corneli and C. Danoff. **Paragogy**. In: *Proceedings of the 6th Open Knowledge Conference*. Ed. by S. Hellmann, P. Frischmuth, S. Auer, and D. Dietrich. Berlin, Germany, 2011.

Originality: A theory of "peer produced peer learning" is needed to address novel organisational learning challenges in online, peer produced, learning environments. In particular, Rhodes's conception of andragogy does not fully describe the productive aspects of learning in free software, wikis, or small-group discussions within MOOCs.

Significance: The ideas in the paper inspired internet scholar Howard Rheingold to convene the Peeragogy project, leading to further collaborative research on this topic.

Rigour: The theory was developed through participant observation as a course designer, facilitator, student, and community member at the Peer-2-Peer University (P2PU).

J. Corneli, A. Jordanous, C. Guckelsberger, A. Pease, and S. Colton. **Modelling serendipity in a computational context**. 2016. arXiv:1411.0440 [cs.AI].

Originality: We clarify the role of discovery and invention in serendipitous events, and provide a measure of the serendipity potential of a system.

Significance: Serendipity has captured considerable interest in information science (e.g, as a way to generate recommendations), but this paper brings the concept into the field of AI, and uses serendipity to theorise systems that can cope well with unexpected scenarios. This will be relevant to future deployments of AI in society.

Rigour: Our evaluation framework is applied to three case studies, showing both positive and negative examples, and showing how our model of serendipity can guide future work in each case.

Publications

Journals

6. A. Pease, J. Lawrence, K. Budzynska, J. Corneli, and C. Reed. **Lakatos-style Collaborative Mathematics through Dialectical, Structured and Abstract Argumentation**. In: *Artificial Intelligence* 246 (2017), pp. 181–219. **CORE: A***.
5. J. Corneli. **Paragogical praxis**. In: *E-Learning and Digital Media* 9.3 (2012), pp. 267–272.
4. J. Corneli, I. Corwin, S. Hurder, V. Sesum, Y. Xu, E. Adams, D. Davis, M. Lee, R. Visocchi, and N. Hoffman. **Double bubbles in Gauss space and spheres**. In: *Houston J. Math* 34.1 (2008), pp. 181–204.
3. J. Corneli, N. Hoffman, P. Holt, G. Lee, N. Leger, S. Moseley, and E. Schoenfeld. **Double bubbles in S^3 and H^3** . In: *Journal of Geometric Analysis* 17.2 (2007), pp. 189–212.
2. J. Corneli, P. Holt, G. Lee, N. Leger, E. Schoenfeld, and B. Steinhurst. **The double bubble problem on the flat two-torus**. In: *Transactions of the American Mathematical Society* 356.9 (2004), pp. 3769–3820.
1. M. C. Alvarez, J. Corneli, G. Walsh, and S. Beheshti. **Double bubbles in the three-torus**. In: *Experimental Mathematics* 12.1 (2003), pp. 79–89.

Conferences

20. J. Corneli, U. Martin, D. Murray-Rust, and A. Pease. **Towards mathematical AI via a model of the content and process of mathematical question and answer dialogues**. In: *Intelligent Computer Mathematics 10th International Conference, CICM 2017, Edinburgh, UK, 2017, Proceedings*. Ed. by H. Geuvers, M. England, O. Hasan, F. Rabe, and O. Teschke. 2017, to appear.
19. J. Corneli and M. Schubotz. **math.wikipedia.org: A vision for a collaborative, semi-formal, language independent math(s) encyclopedia**. In: *2nd Conference on Artificial Intelligence and Theorem Proving (March 26–30, 2017, Obergurgl, Austria)*. Ed. by T. C. Hales, C. Kaliszyk, S. Schulz, and J. Urban. 2017.
18. J. Corneli. **An institutional approach to computational social creativity**. In: *Proceedings of the Seventh International Conference on Computational Creativity, ICCO 2016*. Ed. by A. Cardoso, F. Pachet, V. Corruble, and F. Ghedini. 2016.
17. J. Charnley, S. Colton, M. T. Llano, and J. Corneli. **The FloWr Online Platform: Automated Programming and Computational Creativity as a Service**. In: *Proceedings of the Seventh International Conference on Computational Creativity, ICCO 2016*. Ed. by A. Cardoso, F. Pachet, V. Corruble, and F. Ghedini. 2016.
16. M. T. Llano, C. Guckelsberger, R. Hepworth, J. Gow, J. Corneli, and S. Colton. **What If A Fish Got Drunk? Exploring the Plausibility of Machine-Generated Fictions**. In: *Proceedings of the Seventh International Conference on Computational Creativity, ICCO 2016*. Ed. by A. Cardoso, F. Pachet, V. Corruble, and F. Ghedini. 2016.
15. M. Kaliakatsos-Papakostas, R. Confalonieri, J. Corneli, A. Zacharakis, and E. Cambouropoulos. **An Argument-based Creative Assistant for Harmonic Blending**. In: *Proceedings of the Seventh International Conference on Computational Creativity, ICCO 2016*. Ed. by A. Cardoso, F. Pachet,

- V. Corruble, and F. Ghedini. 2016. **Best paper award.**
14. J. Corneli, C. J. Danoff, C. Pierce, P. Ricuarte, and L. Snow MacDonald. **Patterns of Peeragogy.** In: *Pattern Languages of Programs Conference 2015 (PLoP'15), Pittsburgh, PA, USA, October 24-26, 2015.* Ed. by F. Correia. **ACM.** 2016.
 13. J. Corneli, A. Jordanous, R. Shepperd, M. T. Llano, J. Misztal, S. Colton, and C. Guckelsberger. **Computational Poetry Workshop: Making Sense of Work in Progress.** In: *Proceedings of the Sixth International Conference on Computational Creativity, ICCO 2015.* Ed. by S. Colton, H. Toivonen, M. Cook, and D. Ventura. 2015.
 12. F. Bou, J. Corneli, D. Gómez-Ramírez, E. Maclean, A. Smaill, and A. Pease. **The role of blending in mathematical invention.** In: *Proceedings of the Sixth International Conference on Computational Creativity, ICCO 2015.* Ed. by S. Colton, H. Toivonen, M. Cook, and D. Ventura. 2015.
 11. J. Corneli, D. Marciniak, C. J. Danoff, C. Pierce, P. Ricaurte, J. Herder, S. Burroughs, G. Brett, and J. Graves. **Building the Peeragogy Accelerator.** In: *Proceedings of OER14: building communities of open practice.* Ed. by M. Quentin-Baxter. 2014.
 10. S. Colton, A. Pease, J. Corneli, M. Cook, and T. Llano. **Assessing Progress in Building Autonomously Creative Systems.** In: *Proceedings of the Fifth International Conference on Computational Creativity.* Ed. by D. Ventura, S. Colton, N. Lavrač, and M. Cook. 2014.
 9. D. Ginev and J. Corneli. **NNexus Reloaded.** In: *Intelligent Computer Mathematics.* Ed. by S. M. Watt, J. H. Davenport, A. P. Sexton, P. Sojka, and J. Urban. Vol. 8543. Lecture Notes in Computer Science. Springer International Publishing, 2014, pp. 423–426.
 8. P. Mulholland, A. Wolff, Z. Zdrahal, N. Li, and J. Corneli. **Constructing and Connecting Storylines to Tell Museum Stories.** In: *Interactive Storytelling: 6th International Conference, ICIDS 2013, Istanbul, Turkey, November 6-9, 2013, Proceedings.* Ed. by H. Koenitz, T. I. Sezen, G. Ferri, M. Haahr, D. Sezen, and G. Çatak. Vol. 8230. Lecture Notes in Computer Science. Springer International Publishing, 2013, pp. 121–124.
 7. C. Lange, P. Ion, A. Dimou, C. Bratsas, J. Corneli, W. Sperber, M. Kohlhase, and I. Antoniou. **Reimplementing the Mathematics Subject Classification (MSC) as a Linked Open Dataset.** In: *Intelligent Computer Mathematics.* Ed. by J. Jeuring, J. A. Campbell, J. Carette, G. Reis, P. Sojka, M. Wenzel, and V. Sorge. Vol. 7362. Lecture Notes in Computer Science. Springer Berlin Heidelberg, 2012, pp. 458–462.
 6. M. Kohlhase, J. Corneli, C. David, D. Ginev, C. Jucovschi, A. Kohlhase, C. Lange, B. Matican, S. Mirea, and V. Zholudev. **The Planetary System: Web 3.0 & Active Documents for STEM.** In: *Procedia Computer Science 4 (2011).* Proceedings of the International Conference on Computational Science, ICCS 2011, pp. 598–607. **CORE: A; Google Scholar citations: 51.**
 5. J. Corneli and M. Ponti. **Detecting mathematics learning online.** In: *Proceedings of the 8th International Conference on Networked Learning 2012.* Ed. by V. Hodgson, C. Jones, M. de Laat, D. McConnell, T. Ryberg, and P. Sloep. 2012.
 4. J. Corneli and A. Mikroyannidis. **Personalised and Peer-Supported Learning: The Peer-to-Peer Learning Environment (P2PLE).** In: *Proceedings of the PLE Conference 2011.* Southampton, UK, 2011.

3. J. Corneli and C. Danoff. **Paragogy**. In: *Proceedings of the 6th Open Knowledge Conference*. Ed. by S. Hellmann, P. Frischmuth, S. Auer, and D. Dietrich. Berlin, Germany, 2011.
2. J. Corneli. **GravPad**. In: *Proceedings of the 6th International Symposium on Wikis and Open Collaboration (WikiSym 2010)*. Ed. by P. Ayers and F. Ortega. **ACM**. 2010. **CORE: B**.
1. J. Corneli and A. Krowne. **A Scholia-based Document Model for Commons-based Peer Production**. In: *Free Culture and the Digital Library Symposium Proceedings*. Ed. by M. Halbert. Atlanta, Georgia: MetaScholar Initiative at Emory University, 2005, pp. 240–253.

Workshops

12. J. Corneli and R. Puzio. **Modelling the way mathematics is actually done**. In: *2017 International Workshop on Functional Art, Music, Modelling and Design (FARM 2017)*. **ACM**, (submitted).
11. U. Martin, A. Pease, and J. Corneli. **Bootstrapping the next generation of mathematical social machines**. In: *Off the Beaten Track workshop at POPL, UPMC Paris, January 21, 2017*. Ed. by L. Kuper and B. Atkey. **ACM**. 2017.
10. D. Winterstein and J. Corneli. **X575: writing rengas with web services**. In: *Workshop on Computational Creativity in Natural Language Generation (CC-NLG) held at INLG, September 5th, University of Edinburgh*. Ed. by P. Gervás and M. Purver. 2016.
9. J. Corneli and M. Corneli. **Teaching natural language to computers**. In: *Language Sense on Computers Workshop at IJCAI2016, July 9th, 2016*. Ed. by A. Abe and R. Rzepka. 2016.
8. J. Gow and J. Corneli. **Towards generating novel games using conceptual blending**. In: *Proceedings of Experimental AI in Games 2 (EXAG2), 14-15 November 2015, Santa Cruz, CA, USA*. ed. by M. Cook, A. Liapis, and A. Zook. 2015.
7. J. Corneli and A. Jordanous. **Implementing feedback in creative systems: A workshop approach**. In: *Workshop on AI and Feedback at IJCAI2015, July 26th, 2015*. Ed. by N. Osman and M. Yee-King. 2015.
6. J. Corneli and E. Maclean. **The Search for Computational Intelligence**. In: *Social Aspects of Cognition and Computing Symposium, Proc. Annual Convention of the Society for the Study of Artificial Intelligence and Simulation of Behaviour, University of Kent, Canterbury, UK, 20-22nd April 2015*. Ed. by Y. J. Erden, R. Giovagnoli, and G. Dodig-Crnkovic. 2015.
5. B. Tomlinson, J. Ross, P. André, E. Baumer, D. Patterson, J. Corneli, M. Mahaux, S. Nobarany, M. Lazzari, B. Penzenstadler, A. Torrance, D. Callele, G. Olson, M. Silberman, M. Ständer, F. Palamedi, A. Salah, E. Morrill, X. Franch, F. Mueller, J. Kaye, R. Black, M. Cohn, P. Shih, J. Brewer, N. Goyal, P. Näkki, J. Huang, N. Baghaei, and C. Saper. **Massively distributed authorship of academic papers**. In: *CHI'12 Extended Abstracts on Human Factors in Computing Systems*. **ACM**. 2012, pp. 11–20.
4. J. Corneli and M. Dumitru. **PlanetMath/Planetary**. In: *Joint Proceedings of the 24th OpenMath Workshop, the 7th Workshop on Mathematical User Interfaces (MathUI), and the Work in Progress Section of the Conference on Intelligent Computer Mathematics*. (Bremen, Germany, July 9–13, 2012). Ed. by J. Davenport, J. Jeuring, C. Lange, and P. Libbrecht. CEUR Workshop Proceedings 921. Aachen, 2012, pp. 66–72.

3. J. Corneli, C. Jucovschi, and A. Mikroyannidis. **PlanetMath Redux: Web 2.0 infrastructure for mathematical problem solving**. In: *Workshop on Technology-Enhanced Learning for Mathematics and Science (TELMAS) at ECTEL, 21 September 2011, Palermo, Italy*. (2011).
2. J. Corneli and A. Mikroyannidis. **Live annotation and content discovery in personal learning environments**. In: *Workshop on Mash-up Personal Learning Environments at ECTEL, 29 September 2010, Barcelona, Spain*. 2010.
1. C. David, D. Ginev, M. Kohlhase, and J. Corneli. **eMath 3.0: Building Blocks for a Social and Semantic Web for Online Mathematics & eLearning**. In: *Workshop on Mathematics and ICT: Education, Research and Applications*. Ed. by I. Mierlus-Mazilu. Bucharest, Romania, 2010.

Book chapters

5. J. Corneli and A. Pease. Evaluating Creativity. In: *Concept Invention: Foundations, Implementation, Social Aspects and Applications*. Ed. by R. Confalonieri, M. Schorlemmer, and A. Pease. Springer, 2017 (contracted, sent to publisher).
4. J. Corneli, A. Pease, and D. Stefanou. Social Aspects of Concept Invention. In: *Concept Invention: Foundations, Implementation, Social Aspects and Applications*. Ed. by R. Confalonieri, M. Schorlemmer, and A. Pease. Springer, 2017 (contracted, sent to publisher).
3. S. Colton, A. Pease, J. Corneli, M. Cook, R. Hepworth, and D. Ventura. **Stakeholder Groups in Computational Creativity Research and Practice**. In: *Computational Creativity Research: Towards Creative Machines*. Ed. by T. R. Besold, M. Schorlemmer, and A. Smaill. Thinking Machines: Studies in Computational Cognition. Atlantis - Springer, 2015.
2. J. Corneli, A. Keune, A. Lyons, and C. Danoff. **Peeragogy in Action**. In: *The Open Book*. Ed. by K. Braybrooke, J. Nissilä, and T. Vuorikivi. #3 in the Reaktio Series. The Finnish Institute, London, 2013, pp. 80–87.
1. J. Corneli and A. Mikroyannidis. **Crowdsourcing Education: A Role-Based Analysis of Online Learning Communities**. In: *Collaborative Learning 2.0: Open Educational Resources*. Ed. by A. Okada, T. Connolly, and P. Scott. IGI Global, 2012.

Unrefereed and popular material

3. J. Corneli, C. J. Danoff, C. Pierce, P. Ricuarte, and L. Snow MacDonald, eds. **Peeragogy Handbook**. 3rd ed. Chicago, IL/Somerville, MA.: PubDomEd/Pierce Press, 2016.
2. J. Corneli. **Towards a Creativity Commons**. In: *Working group on “The Commons as Transformative Paradigm”, Proc. Fifth Workshop on the Ostrom Workshop (WOW5)*. Ed. by W. Hoeschele and H. Finidori. Indiana University Bloomington. 2014.
1. J. Corneli. **The PlanetMath Encyclopedia**. In: *The ITP 2011 Workshop on Mathematical Wikis (MathWikis-2011)*. Ed. by C. Lange and J. Urban. 2011. **(Paper to accompany invited talk.)**

Work in progress

4. J. Corneli, L. Lane, F. Tanswell, and U. Martin. The well-designed mathematical social machine. Publication target: *Artificial Intelligence*. In preparation.

3. U. Martin, A. Pease, D. Murray-Rust, G. Rino Nesin, and J. Corneli. Extending Inference Anchoring Theory for use with mathematical argumentation. Publication target: *Argumentation*. In preparation.
2. J. Corneli, A. Jordanous, C. Guckelsberger, A. Pease, and S. Colton. **Modelling serendipity in a computational context**. Publication target: *ACM Computing Surveys*. In preparation.
1. A. Pease and J. Corneli. A meta-evaluation of evaluation measures in computational creativity. Publication target: *Digital Creativity*. In preparation.

Talks (selected, recent)

5. J. Corneli. Reasoning about mathematics with graphical programs. *CIAO @ 25 - AB @ 70 Workshop, 23 May, Edinburgh, UK*. 2017.
4. J. Corneli. 15 years before the math: a tech noir memoir. *Design Informatics Research Seminar, 2 March, Edinburgh, UK*. 2017.
3. J. Corneli. Computational creativity and embedded evaluation. *Royal Holloway Computer Science Seminar, 15 November, Egham, UK*. 2016.
2. J. Corneli. Embedded evaluation. *From Computational Creativity To Creativity Science, 19-22 September, Bielefeld, Germany*. Center for Interdisciplinary Research/Zentrum für interdisziplinäre Forschung (ZiF). 2016.
1. D. Murray-Rust, J. Corneli, A. Pease, U. Martin, and M. Snaithe. **Synchronised multi-perspective analysis of online mathematical argument**. *European Conference on Argumentation: Argumentation and Reasoned Action, 9-12 June, Lisbon, Portugal*. 2015.

Event organisation

2. Three-day workshop on “**Enabling Mathematical Cultures**” to take place at Oxford University, December 5-7, 2017.
1. “**AISB Member Workshop VII: Serendipity Symposium**” at St Mary’s University, June 15, 2017.

Grants

3. (In preparation.) EPSRC responsive mode; proposal to build a computable model of mathematics Q&A exchanges in Calculus. PI: Alison Pease, University of Dundee. (Budget: ≈£150000)
2. **Making sense of meanings in dialogue**, 6 months Flexibility Funding through “The Integration and Interaction of Multiple Mathematical Reasoning Processes”, EPSRC (EP/N014758/1). (Award: £19202.)
1. **Semantic Adaptivity and Social Networking in Personal Learning Environments** (Studentship). Open University. PI: Joseph Corneli. 2009. (Award: £40545)

Additional scholarly engagement

- PC AISB Symposium on Computational Creativity, 2017.

- Reviewed for *Transactions on Learning Technologies*, 2016.
- PC International Conference on Computational Creativity, 2016.
- PC Conference on Intelligent Computer Mathematics 2015, 2016.
- Reviewed for *Connection Science*, 2015.
- PC Workshop on Semantic Publication at the European Semantic Web Conference, 2011.
- Reviewed for *Transactions on Information Systems*, 2011