

# Gully Burns

## Curriculum Vitae

+1 (310) 279 3145  
gullyburns@gmail.com  
sciknowengine.github.io  
0000-0003-1493-865X  
SciKnowEngine  
SciKnowEngine



### Education

- 1992–1997 **D.Phil., Physiology**, *Magdalen College, Oxford University*, Oxford, England.
- Dissertation: 'Neural Connectivity of the Rat: Theory, Methods and Applications', [http://www.neurosolar.org/Download\\_files/Burns-DPhil-Thesis-1997.pdf](http://www.neurosolar.org/Download_files/Burns-DPhil-Thesis-1997.pdf)
  - Curated a database of area-to-area neural projections for the rat from >1,000 references
  - Analyzed using non-metric multidimensional scaling, cluster analysis, Procrustes rotation
  - Contributed to similar analytic studies of the organization of monkey and cat cortices
- 1988–1991 **B.Sc.(Hons), Physics (First class)**, *Imperial College*, London, England.
- Half theory option in final year (group theory + quantum mechanics)
  - Interferometry Laboratory Prize, 2nd year

### Professional Experience

- 2015–2018 **Research Lead**, *Information Sciences Institute, University of Southern California*, Marina del Rey, California.  
Developing a discovery informatics research program based on collaboration with machine intelligence experts across multiple institutions
- 2010–2015 **Project Leader**, *Information Sciences Institute, University of Southern California*, Marina del Rey, California.  
Transitioned to working with AI community, developed text mining systems and applications
- 2005–2010 **Neuroinformatics Research Scientist**, *Information Sciences Institute, University of Southern California*, Marina del Rey, California.  
Initial work in text mining systems and knowledge engineering
- 2000–2005 **Research Assistant Professor, Neuroinformatics**, *University of Southern California*, Los Angeles, California.  
Worked as an embedded neuroinformatics research scientist within an experimental neuroscience group
- 1997–2000 **Postdoctoral Researcher, Neuroinformatics**, *University of Southern California*, Los Angeles, California.  
Developed applications and tools based on neural connectivity databases and performed neuroanatomical experimental work

### Research Interests

- **The “Knowledge - Question - Experiment - Data Model of Scientific Investigation”** - This work involves developing the 'KQED' formalism as a cyclic model of scientific investigation to serve as a high-level template for knowledge engineering work

- **Large Scale Structure of Scientific Paradigms** - Machine learning analysis of the high-level structure of large corpora to look for patterns suggestive of different scientific paradigms
- **Pedagogical Knowledge Systems** - Understanding and enabling how human experts learn using machine intelligence
- **Machine-Intelligence-Assisted Biocuration** - Development of AI-based methods to assist human bio-curators to organize the scientific literature into databases
- **Machine Reading Applications** - Application of machine reading approaches (such as Abstract Meaning Representation) to automatically process published information from scientific literature
- **Systems Level Neuroscience** - Application of computational approaches to neural structure and function, particularly connectomics
- **Semantic Web + Linked Data for Modeling Biological Domain Knowledge** - With particular applications to neurodegenerative disease, cancer-based studies of intracellular signaling pathways and immunological assays.

## Professional Activities

### NIH Study Section

- **Reviewer:** Special Emphasis Panel/Scientific Review Group for Neurotechnology (NT) Study Section NT meeting October, 2008
- **Reviewer:** Biomedical Informatics, Library and Data Sciences (BILDS) Review Committee meeting November, 2017
- **Reviewer:** Biomedical Informatics, Library and Data Sciences (BILDS) Review Committee meeting March, 2018
- **Reviewer:** Joined standing Biomedical Informatics, Library and Data Sciences (BILDS) Committee, November 2018, Four years service

### Journal Reviews

- **Journal Reviewer** - *Frontiers in Neuroscience*, *Frontiers in Neuroinformatics*, *Journal of Web Semantics*, *BMC Bioinformatics*

### Guest Editor

- **Co-Editor** for *Frontiers Research Topic* - Discovery Informatics in Neuroscience - Extracting and Shaping Actionable Knowledge from Texts and Data.  
<http://journal.frontiersin.org/researchtopic/3184>

### Conference Organizing and Program Committees

- **Co-Organizer:** *AAAI Fall Workshop: Discovery Informatics* - Arlington, VA, Nov. 2013  
<http://www.aaai.org/Press/Reports/Symposia/Fall/fs-13-01.php>
- **Organizer and Chair:** *SciKnowMine Release Workshop - Bridging BioNLP and Biocuration*, Marina del Rey, CA, Aug. 2013  
[http://www.isi.edu/projects/sciknowmine/sciknowmine\\_release\\_workshop\\_-\\_bridging\\_bionlp\\_and\\_biocuration](http://www.isi.edu/projects/sciknowmine/sciknowmine_release_workshop_-_bridging_bionlp_and_biocuration)

- **Co-Organizer:** *Vaccine and Drug Ontology in the Study of Mechanism and Effect workshop (VDOSME)*, International Conference on Biomedical Ontology (ICBO), Graz, Austria, 2012
- **Conference Program Committee:** Computer Science + Semantic Web: International Semantic Web Conference (ISWC), Sydney, Australia, Oct. 2013
- **Supporting Member:** "Beyond the PDF" Workshop, University of California San Diego, Jan. 2011

## Presentations

### Online Videos

- **Flipping the Light Switch - Using the Cambrian Explosion as a Metaphor for Accelerated Scientific Discovery**, AAAI Symposium Fall Symposium on Accelerating Science: A Grand Challenge for AI, Arlington, VA, 2016.  
<https://youtu.be/0wSF1wsKZyg?t=45m3s>
- **Using Experimental Design to Design Neuroinformatics Data Structures**, INCF2013.  
<https://www.youtube.com/watch?v=NP1BejxhLJg>
- **Introductory Remarks**, SciKnowMine 2013 Release Meeting.  
<https://www.youtube.com/watch?v=pYkUmHYPYF8>
- **The SciKnowMine Project - Bridging BioNLP and Biocuration**, SciKnowMine 2013 Release Meeting.  
<https://www.youtube.com/watch?v=d286KHsilme>
- **The SciKnowMine Project - Building Bridges: Moderated Community Discussion**, SciKnowMine 2013 Release Meeting.  
<https://www.youtube.com/watch?v=-dB7XTzEXGw>
- **Organizing the World's Scientific Knowledge to Make it Universally Accessible and Powerful**, GoogleTechTalks, 2013.  
<https://www.youtube.com/watch?v=DU5HRck4bn4>
- **Structured Nanopublications Pertaining to the Drugome: A Knowledge Engineering from Experimental Design (KEfED) Model**, Beyond the PDF, San Diego Meeting, 2011- Presenter and Co-Organizer.  
<https://www.youtube.com/watch?v=-xXF9-maxtw>

### Invited Presentations

- **Flipping the Light Switch - Using the Cambrian Explosion as a Metaphor for Accelerated Scientific Discovery**, AAAI Symposium Fall Symposium on Accelerating Science: A Grand Challenge for AI, Arlington, VA, 2016
- **Open Source Development, Crossing Paradigms and Biocuration. A Strategic View**, National Center for Biomedical Informatics, Bethesda, MD, 2014
- **Supernovae, Neutrinos, and Discovery**, Sunday Assembly, Los Angeles, CA, 2014
- **Supporting Document Triage with the SciKnowMine System in the Mouse Genome Informatics (MGI) Curation Process**, BioCreative 4, Bethesda, MD, 2013

- **Unpacking and Leveraging the Structure of Data for Knowledge Engineering Systems**, Merce Crosas' group, Harvard University, Cambridge, MA, 2013
- **Using Scientific Paradigms as a Practical Methodology for Developing Biomedical Informatics Systems**, European Bioinformatics Institute, Cambridge, England, 2013
- **Practical Approach and Infrastructure for the Accelerated Construction of Biocuration Systems**, Biocuration, Cambridge, England, 2012
- **Developing Tools for Biocuration and Reasoning over Biomedical Articles**, Jackson Laboratory Visit, Bar Harbor, MA, 2012
- **Knowledge Engineering from Experimental Design**, Neuroscience Information Framework, Open Webinar, Teleconference, 2011
- **The SciKnowMine System: Infrastructure for Biocuration Applied to MGI Document Triage**, Biocuration, Tokyo, Japan, 2010
- **A Framework for BioCuration Workflows** (with Martin Krallinger), Biocuration, Berlin, Germany, 2009
- **Curating Experiments and Resulting Data for Disease Foundations**, Biocuration, Berlin, Germany, 2009
- **A Grand Strategy for Biomedical Knowledge Engineering**, Invited talk, Larry Hunter's Laboratory, Denver, CO, 2009
- **Ars Veritatis: The Art of Truth**, Mindshare, Los Angeles, CA, 2009
- **Improving the Efficiency of Phenotype Biocuration with Natural Language Processing**, Jackson Laboratory Visit, Bar Harbor, MA, 2007
- **Using Large-Scale Semi-Automated Information Extraction for the Biocuration of Experimental Observations**, Biocuration, San Jose, CA, 2007
- **Snapshots of Neuroscience: Efficient Methods to Build Year-by-Year Maps of SfN Abstracts**, 'Pubmed Plus' Meeting, Society for Neuroscience, San Diego, CA, 2007
- **Infrastructure for Annotation-Driven Information Extraction from the Primary Scientific Literature: Principles and Practice**, SOB DAT07, Salt Lake City, UT, 2007
- **NeuroScholar: Knowledge Engineering for Neuroscience**, National Center for Biomedical Ontology, Stanford University, Palo Alto, CA, 2006
- **Knowledge Engineering in Neuroscience**, Nordic Neuroscience Meeting, Copenhagen, Denmark, 2006
- **Ontology-Engineering Approaches Based on Semi-Automated Curation of the Primary Literature**, PATO Meeting, Stanford University, Palo Alto, CA, 2006
- **NeuroScholar: A Practical Solution Addressing Information-Overload in Systems Level Neuroscience**, Microsoft eScience Meeting 2005, Seattle, WA, 2005
- **The Laboratory as a Knowledge Factory**, Jim Herman's Laboratory, Cincinnati, OH, 2005

- **Using Knowledge Engineering to Study the Brain**, Microsoft eScience Meeting, Seattle, WA, 2004
- **Neuroinformatics, Applied Scientific Knowledge Engineering and the Laboratory as a Knowledge Factory**, Redwood Neuroscience Institute, San Jose, CA, 2004

## Open Source Software Development

I pursue an active commitment to open source programming methodology.

Website: <http://sciknowengine.github.io/>

Source code: <http://github.com/SciKnowEngine>

### Github + SourceForge Repositories

- **SciKnowMap** - Python scripts to generate topic maps over mid sized text corpora  
<https://github.com/SciKnowEngine/sciknowmap>
- **SciDT-pipeline** - UIMA pipelines to run SciDT discourse tagger over PubMedCentral open access papers using Docker and ElasticSearch to store precomputed large scale word embeddings  
<https://github.com/BMKEG/sciDT-pipeline>
- **BioC-based UIMA Text-Mining Pipeline** - ClearTk (Java) UIMA pipelines for natural language processing based on the generic BioC annotation format developed by NLM. Currently in use for the Big Mechanisms Program as an efficient pre-processing pipeline for machine learning and science discourse parsing.  
<https://github.com/BMKEG/UimaBioC>
- **PDF-Based Digital Library Web Application** - Spring+Robotlegs web applications that permits PDF management and text-based annotations onto papers.  
<https://github.com/BMKEG/bioscholarProject>
- **Layout Aware PDF Text Extraction** - Java library to extract text based on rules for the formatting layout of journals. Described in Ramakrishnan et al., 2012.  
<https://github.com/BMKEG/lapdfstext> (39 stars on GitHub)
- **AMR-LD Converter** - Python library to convert Abstract Meaning Representation graphs to RDF (derived from derived from Naomi Saphra's 'AMRICA' library).  
<https://github.com/BMKEG/amr-ld>
- **KEfED Editor** - Flex Web Application for KEfED model development and curation. Described in Russ et al., 2011.  
<https://github.com/BMKEG/bioscholar-v1.0>. (End-of-life)
- **kefed.io** - Javascript Web Application for KEfED model development and curation (reimplementation of KEfED editor based on MxGraph platform).  
<https://github.com/SciKnowEngine/kefed.io>
- **NeuARt Web Application** - Flex Web Application of the NeuARt system. Described in Tallis et al., 2011.  
<https://github.com/GullyAPCBurns/neuart>

- **View-Primitive-Data-Model framework** - Object relational mapping system based on mapping UML models onto MySQL database queries. Described in Burns et al., 2002.  
<https://github.com/BMKEG/vpdmfProject>
- **NeuroScholar System** - Java 1.6 desktop application (with installers) as original literature based modeling system. System was built on a modular architecture with plug-in capabilities.  
<https://sourceforge.net/projects/neuroscholar/files/>
- **NeuARt II System** - Java 1.6 desktop application (with installers) as original Neuroanatomical atlasing system. NeuArt used the same homegrown object-relational mapping system as NeuroScholar.  
<https://sourceforge.net/projects/neuroscholar/files/>

### Programming Languages, Toolkits and Tools

<i>Proficient</i>	Python, Java (Spring, ClearTk / UIMA), bash shell, MySQL, Excel
<i>Mid-Level</i>	Python NLP + ML Libraries (SciKit-Learn, Gensim, NLTK), Neural Net Toolkits (TensorFlow, Keras), Perl, Matlab/Octave, R, Processing, ElasticSearch, MongoDB, Neo4J, SPARQL, Jena, JavaScript (Polymer, React, AngularJS)
<i>Beginner</i>	Scala (Processors and REACH toolkit from CLULab), MapReduce architectures (Hadoop, Spark)

### Teaching

**Guest Lecturer**, Seminars in Biomedical Engineering, October 2013

**Guest Lecturer**, USC Neuroscience Program about Neuroinformatics, April 2013

**Guest Lecturer**, USC Neuroinformatics Masters Course , October 2011

### Advising

**Dissertation Committee Member**: Kyle Ambert , Bioinformatics, Oregon Health and Science University, 2012. Currently, Data Scientist at Intel Corporation

**Supervisor**: Vit Novacek - Summer visitor from DERI, 2012

**Dissertation Committee Member**, Yi-Shin Chen, Computer Science, University of Southern California, 2002. Currently, Assistant Professor, Department of Computer Science, National Tsing Hua University, Taiwan

### Academic Service

**Organizer** of 'What's Going On?' seminars by Project Leaders at ISI Friday Leadership Meetings

**Organizer** of AI Seminar talks at ISI (2010-2011)

---

## Funded Awards and Grants

- 2017-2020 **Evidence Extraction Systems for the Molecular Interaction Literature (PI)**  
*1R01LM012592-01*  
Machine reading methods typically operate on any text they can find, but the most important data in a scientific document are figures and text describing primary experimental evidence. This project is focussed on using information extraction techniques for figures and text to pinpoint and extract evidence from scientific papers in a well-defined subfield (molecular interactions) so that we can then generalize machine reading methods to other domains.
- 2015-2016 **Technical Knowledge Acquisition (PI)**  
*FA8650-15-C-9102, IARPA Seedling*  
This project is an effort to develop automated methods for building a reading list over a large technical document corpus to accelerate learning. We focus our effort on computing the knowledge complexity of the subject material and its pedagogical value to the end user.
- 2014-2018 **REAPER: Reading, Extraction, and Assembly of Pathways for Evidentiary Reasoning (Co-Investigator)**  
*W911NF-14-1-0436, DARPA Big Mechanisms Program*  
This project is based on applying the KEfED model to the DARPA machine-reading challenge to extract causal knowledge about cancer pathways from research articles. (PI: Hovy)
- 2015-2016 **Operation, Support and Strategy Enhancement of the Neuroscience Information Framework (Co-Investigator)**  
*U24 DA039832-01, National Institute on Drug Abuse (NIDA)*  
This project is a support contract to apply the Karma information integration system developed at ISI to NIF's extensive neuroscience data collection. (PI: Grethe)
- 2012 - 2012 **Crux Development Grant (PI)**  
*NIH/NCRR*  
This was a grant issued by the Kinetics Foundation to fund development of ELN technology based on the KEfED approach.
- 2010 - 2011 **A Generic Repository for Experimental Data (PI)**  
*Michael J. Fox Foundation*  
As a proof-of-concept, we constructed a repository to capture the design of a small subset of the experiments currently funded by the Michael J. Fox Foundation and built a system to store and manage data from those experiments.
- 2009 - 2012 **Text Mining Infrastructure for the Entire Biological Literature (PI)**  
*#849977-1, NSF DBI*  
This project was concerned with developing 'SciKnowMine', a cyberinfrastructure for biocuration that supports the activities of non-biomedical NLP researchers with the goal of scaling up to the size of the entire literature.

- 2009 - 2014 **Informatics Infrastructure for Vector-Based Neuroanatomical Atlases (PI)**  
*R01 MH 079068-03A2, NIH/NIMH*  
 This project was based around building knowledge engineering software capable of browsing, querying, and displaying with neuroanatomical knowledge in the form of maps, images and text-based facts in an open neuroinformatics system architecture.
- 2008 - 2013 **Bio-Informatics Research Network Coordinating Center (BIRN-CC) (Co-Investigator)**  
*1U24RR025736-1, NIH/NCRR*  
 The major goal of this project was to provide support and systems for BIRN's activities. (PI: Kesselman)
- 2008 - 2010 **Center for Health Informatics (Co-Investigator)**  
*St. John's Health Center*  
 The Center for Health Informatics was a large scale, multidisciplinary center (incorporating intelligent systems, high-throughput networking and grid computing) with the mission to deliver turnkey information processing and delivery solutions to the clinical community. (PI: Kesselman)
- 2008 - 2008 **Topic Maps for CRISP (PI)**  
*NIH/NINDS*  
 The major goal of this project was to build tools to that permit users to browse online 'topic-maps' for the CRISP database.
- 2007- 2012 **BioScholar: A Biomedical Knowledge Engineering Framework Based on the Published Literature (PI)**  
*R01 GM 083871-1, NIH/NIGMS*  
 The major goal of this project was to create a deployable knowledge management/engineering system for bench scientists that may be constructed, curated, and maintained within a single laboratory.
- 2005-2006 **Sangam, A System for Integrating Data to Solve Stress-Circuitry-Gene Coupling (Co-Investigator)**  
*1-year E-Sciences unrestricted cash gift, Microsoft*  
 This research was a spin-off from work on the NeuroScholar system. This research project was concerned with developing an 'eScience' application that was built on integrating multiple sources of information into a single representation. (PI: Ghandeharizadeh)
- 2001-2007 **Knowledge Management of the Neuroscientific Literature (PI)**  
*R01 LM07061, NLM NIH*  
 We conceived and developed 'NeuroScholar', which is complete as a functional prototype, was released as an open source project, and is still being downloaded today. It incorporated ontological work, visualization and analysis development, and a study of the neural circuits underlying defensive behavior in the rat.



## Publications

### Peer Reviewed Conferences and Workshops

1. G.A. Burns, X. Shi, Y. Wu, H. Cao, and P. Natarajan, "Towards Evidence Extraction : Analysis of Scientific Figures from Studies of Molecular Interactions," in *SemSci 2018 Workshop, ISWC*, Monterey, California, 2018.
2. J. D. Van Horn, L. Fierro, J. Kamdar, J. Gordon, C. Stewart, A. Bhattra, S. Abe, X. Lei, C. O'Driscoll, A. Sinha, P. Jain, G. Burns, K. Lerman, and J. L. Ambite, "Democratizing data science through data science training." *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*, vol. 23, pp. 292–303, 2018.
3. E. Sheng, P. Natarajan, J. Gordon, and G. Burns, "An Investigation into the Pedagogical Features of Documents," *Association for Computational Linguistics*, pp. 109–120, 2017, bibtex: W17-5012. [Online]. Available: <http://aclweb.org/anthology/W17-5012>
4. Gully A Burns, Randi Vita, James Overton, Ward Fleri, and Bjoern Peters, "Semantic Modeling for Accelerated Immune Epitope Database (IEDB) Biocuration," in *Second International Workshop on Capturing Scientific Knowledge*, Austin, TX, 2017. [Online]. Available: <https://sciknow.github.io/sciknow2017/papers/burns.pdf>
5. G. Burns, P. Dasigi, and E. Hovy, "Extracting Evidence Fragments for Distant Supervision of Molecular Interactions," in *Proceedings of the First Workshop on Enabling Open Semantic Science (SemSci)*, 2017, pp. 7–14. [Online]. Available: <http://ceur-ws.org/Vol-1931/#paper-02>
6. J. Gordon, S. Aguilar, E. Sheng, and G. Burns, "Structured Generation of Technical Reading Lists," *Association for Computational Linguistics*, pp. 261–270, 2017, bibtex: W17-5029. [Online]. Available: <http://aclweb.org/anthology/W17-5029>
7. Gordon, J., Zhu, L., Galstyan, A., Natarajan, P., and Burns, G., "Modeling Concept Dependencies in a Scientific Corpus," in *Proceedings of the Annual Meeting of the Association for Computational Linguistics (ACL2016)*, Berlin, 2016. [Online]. Available: <https://www.aclweb.org/anthology/P16-1082>
8. G. Burns, U. Hermjakob, and J. L. Ambite, "Abstract Meaning Representations as Linked Data," in *International Semantic Web Conference Resources Track*, Kobe, Japan, 2016. [Online]. Available: [https://link.springer.com/chapter/10.1007/978-3-319-46547-0\\_2](https://link.springer.com/chapter/10.1007/978-3-319-46547-0_2)
9. G. Burns, A. de Waard, P. Dasigi, and E. Hovy, "Cycles of Scientific Investigation in Discourse," in *Biocreative*, Oregon, 2016. [Online]. Available: [http://ceur-ws.org/Vol-1747/BT102\\_ICBO2016.pdf](http://ceur-ws.org/Vol-1747/BT102_ICBO2016.pdf)
10. Jonathan Gordon, Linhong Zhu, Aram Galstyan, Prem Natarajan, and Gully Burns, "Modeling Concept Dependencies in a Scientific Corpus," in *Proceedings of the*

*Annual Meeting of the Association for Computational Linguistics (ACL2016)*, Berlin, 2016. [Online]. Available: <https://www.aclweb.org/anthology/P16-1082>

11. G. A. P. C. Burns and H. Chalupsky, "It's all made up - why we should stop building representations based on interpretive models and focus on experimental evidence instead," in *Discovery Informatics: Scientific Discoveries Enabled by AI*, Quebec City, Quebec, 2014. [Online]. Available: <http://www.aaai.org/ocs/index.php/WS/AAAIW14/paper/download/8735/8337>
12. K Ambert, A Cohen, G Burns, E Boudreau, and K Sonmez, "Finna: A Paragraph Prioritization System for Biocuration in the Neurosciences," in *Discovery Informatics Symposium DIS2013*, Arlington VA, 2013.
13. G. A. Burns, M. Tallis, H. Onda, K. B. Cohen, J. Kadin, and J. Blake, "Supporting Document Triage with the SciKnowMine System in the Mouse Genome Informatics (MGI) Curation Process," in *Biocreative 4 Proceedings*, 2013.
14. M. Tallis, D. Dave, and G. A. Burns, "Preliminary meta-analyses of experimental design with examples from HIV vaccine protection studies," in *Discovery Informatics Symposium DIS2012*, Arlington VA, 2012.
15. S. Pokkunuri, C. Ramakrishnan, E. Riloff, E. Hovy, and G. Burns, "The role of information extraction in the design of a document triage application for biocuration," in *BioNLP*, Portland OR, 2011.
16. M. Saxena, S. Kim, G. Burns, A. M. Khan, J. Su, Y. Hamadi, and S. Ghandeharizadeh, "An Overview of Sangam: A System for Integrating Data to Investigate Stress-Circuitry-Gene Coupling," in *IVNET*, submitted, 2005.
17. D. Feng, G. Burns, and E. H. Hovy, "Towards Automated Semantic Analysis on Large Scale Biomedical Text," in *Proceedings of the International Joint Conference on NLP (IJCNLP)*, Hyderabad, India., 2008.
18. G. Burns, D. Feng, T. Ingulfsen, and E. Hovy, "Infrastructure for Annotation-Driven Information Extraction from the Primary Scientific Literature: Principles and Practice," in *1st IEEE International Workshop on Service Oriented Technologies for Biological Databases and Tools (SOBDAT 2007)*, Salt-Lake City, 2007.
19. D. Feng, G. Burns, and E. Hovy, "Extracting Data Records from Unstructured Biomedical Full Text," in *The Joint Meeting of Conference on Empirical Methods in Natural Language Processing and Conference on Computational Natural Language Learning (EMNLP-CoNLL 2007)*, Prague, Czech Republic, 2007.

### Journal Articles

1. A. M. Khan, A. H. Grant, A. Martinez, G. A. Burns, B. S. Thatcher, V. T. Anekonda, B. W. Thompson, Z. S. Roberts, D. H. Moralejo, and J. E. Blevins, "Mapping molecular datasets back to the brain regions they are extracted from: Remembering the native countries of hypothalamic expatriates and refugees,"

- bioRxiv*, 2018, bibtex: Khan307652 bibtex[eprint=<https://www.biorxiv.org/content/early/2018/04/28/307652.full.pdf>;publisher=Cold Spring Harbor Laboratory]. [Online]. Available: <https://www.biorxiv.org/content/early/2018/04/28/307652>
2. P. Dasigi, G. A. P. C. Burns, E. H. Hovy, and A. d. Waard, "Experiment Segmentation in Scientific Discourse as Clause-level Structured Prediction using Recurrent Neural Networks," *CoRR*, vol. abs/1702.05398, 2017. [Online]. Available: <http://arxiv.org/abs/1702.05398>
  3. G. A. Burns, P. Dasigi, A. de Waard, and E. H. Hovy, "Automated detection of discourse segment and experimental types from the text of cancer pathway results," *Database (Oxford)*, p. baw122, 2016. [Online]. Available: <http://database.oxfordjournals.org/content/2016/baw122.abstract>
  4. V. Nováček and G. A. P. C. Burns, "SKIMMR: facilitating knowledge discovery in life sciences by machine-aided skim reading," *PeerJ*, vol. 2, p. e483, 2014.
  5. K. H. Ambert, A. M. Cohen, G. A. Burns, E. Boudreau, and K. Sonmez, "Virk: An Active Learning-based System for Bootstrapping Knowledge Base Development in the Neurosciences," *Frontiers in Neuroinformatics*, vol. 7, no. 38, 2013. [Online]. Available: <http://www.frontiersin.org/neuroinformatics/10.3389/fninf.2013.00038/abstract>
  6. G. A. P. C. Burns and J. A. Turner, "Modeling functional Magnetic Resonance Imaging (fMRI) experimental variables in the Ontology of Experimental Variables and Values (OoEvv)," *Neuroimage*, May 2013.
  7. D. B. Keator, K. Helmer, J. Steffener, J. A. Turner, T. G. M. Van Erp, S. Gadde, N. Ashish, G. A. Burns, and B. N. Nichols, "Towards structured sharing of raw and derived neuroimaging data across existing resources," *Neuroimage*, vol. 82, pp. 647–661, Nov. 2013.
  8. L. Hirschman, G. A. P. C. Burns, M. Krallinger, C. Arighi, K. B. Cohen, a. Valencia, C. H. Wu, A. Chatr-Aryamontri, K. G. Dowell, E. Huala, A. Lourenco, R. Nash, A-L. Veuthey, T. Wieggers, and a. G. Winter, "Text mining for the biocuration workflow," *Database*, vol. 2012, pp. bas020–bas020, Apr. 2012. [Online]. Available: <http://database.oxfordjournals.org/cgi/doi/10.1093/database/bas020>
  9. C. Ramakrishnan, A. Patnia, E. Hovy, and G. Burns, "Layout-Aware Text Extraction from Full-text PDF of Scientific Articles," *Source Code for Biology and Medicine*, vol. 7, no. 1, p. 7, 2012. [Online]. Available: <http://www.scfbm.org/content/7/1/7>
  10. S.-A. Sansone, P. Rocca-Serra, D. Field, E. Maguire, C. Taylor, O. Hofmann, H. Fang, S. Neumann, W. Tong, L. Amaral-Zettler, K. Begley, T. Booth, L. Bougueleret, G. Burns, B. Chapman, T. Clark, L.-A. Coleman, J. Copeland, S. Das, A. de Daruvar, P. de Matos, I. Dix, S. Edmunds, C. T. Evelo, M. J. Forster, P. Gaudet, J. Gilbert, C. Goble, J. L. Griffin, D. Jacob, J. Kleinjans, L. Harland, K. Haug, H. Hermjakob, S. J. H. Sui, A. Laederach, S. Liang, S. Marshall, A. McGrath, E. Merrill, D. Reilly, M. Roux, C. E. Shamu, C. a. Shang, C. Steinbeck, A. Trefethen, B. Williams-Jones, K. Wolstencroft, I. Xenarios, and W. Hide,

- “Toward interoperable bioscience data,” *Nature Genetics*, vol. 44, no. 2, pp. 121–126, Jan. 2012. [Online]. Available: <http://www.nature.com/doifinder/10.1038/ng.1054>
11. E. M. Talley, D. Newman, D. Mimno, B. W. Herr, H. M. Wallach, G. A. P. C. Burns, A. G. M. Leenders, and A. McCallum, “Database of NIH grants using machine-learned categories and graphical clustering,” *Nat Meth*, vol. 8, no. 6, pp. 443–444, Jun. 2011. [Online]. Available: <http://dx.doi.org/10.1038/nmeth.1619>
  12. T. Russ, C. Ramakrishnan, E. Hovy, M. Bota, and G. Burns, “Knowledge Engineering Tools for Reasoning with Scientific Observations and Interpretations: a Neural Connectivity Use Case,” *BMC Bioinformatics*, vol. 12, no. 1, p. 351, 2011. [Online]. Available: <http://www.biomedcentral.com/1471-2105/12/351>
  13. M. Tallis, R. Thompson, T. A. Russ, and G. A. P. C. Burns, “Knowledge synthesis with maps of neural connectivity,” *Front Neuroinform*, vol. 5, p. 24, 2011.
  14. K. Helmer, J. Ambite, J. Ames, R. Ananthakrishnan, G. Burns, A. Chervenak, I. Foster, L. Liming, D. Keator, F. Macchiardi, R. Madduri, JP Navarro, S. Potkin, B. Rosen, S. Ruffins, R. Schuler, JA Turner, A. Toga, C. Williams, and C. Kesselman, “Enabling collaborative research using the Biomedical Informatics Research Network (BIRN),” *J Am Med Inform Assoc.*, vol. 18, no. 4, p. 416, 2011.
  15. C. Ramakrishnan, Jr, J. Blake, G. A. P. C. Burns, K. B. Cohen, H. Drabkin, J. Eppig, E. Hovy, C.-N. Hsu, L. E. Hunter, T. Ingulfsen, K. Livingston, H. Onda, S. Pokkunuri, E. Riloff, C. Roeder, and K. Verspoor, “Building the Scientific Knowledge Mine (SciKnowMine1): a community-driven framework for text mining tools in direct service to biocuration,” in *Language Resources and Evaluation (LREC)*, Malta, 2010.
  16. G. A. Burns and W. C. Cheng, “Tools for Knowledge Acquisition within the NeuroScholar system and their application to anatomical tract-tracing data,” *J Biomed Discov Collab*, vol. 1, no. 1, p. 10, 2006. [Online]. Available: <http://www.j-biomed-discovery.com/content/1/1/10>
  17. A. M. Khan, J. D. Hahn, W.-C. Cheng, A. G. Watts, and G. Burns, “NeuroScholar’s Electronic Laboratory Notebook and its Application to Neuroendocrinology,” *Neuroinformatics*, vol. 4, no. 2, pp. 139–160, 2006.
  18. G. Burns, W.-C. Cheng, R. F. Thompson, and L. Swanson, “The NeuARt II system: a viewing tool for neuroanatomical data based on published neuroanatomical atlases.” *BMC Bioinformatics*, vol. 7, p. 531, 2006.
  19. M. Goto, N. S. Canteras, G. Burns, and L. W. Swanson, “Projections from the Subfornical Region of the Lateral Hypothalamic Area,” *J Comp Neurol*, vol. 493, no. 3, pp. 412–438, 2005.
  20. G. A. P. C. Burns, A. M. Khan, S. Ghandeharizadeh, M. A. O’Neill, and Y.-S. Chen, “Tools and approaches for the construction of knowledge models from the neuroscientific literature,” *Neuroinformatics*, vol. 1, no. 1, pp. 81–109, 2003. [Online]. Available: <http://www.ncbi.nlm.nih.gov/pubmed/15055395>

21. G. Burns, F. Bian, W.-C. Cheng, S. Kapadia, C. Shahabi, and S. Ghandeharizadeh, "Software engineering tools and approaches for neuroinformatics: the design and implementation of the View-Primitive Data Model framework (VPDMf)," *Neurocomputing*, vol. 44-46, pp. 1049–1056, 2002.
22. G. Burns, K. E. Stephan, B. Ludäscher, A. Gupta, and R. Kötter, "Towards a federated neuroscientific knowledge management system using brain atlases," *Neurocomputing*, vol. 38-40, pp. 1633–1641, 2001.
23. K. E. Stephan, L. Kamper, A. Bozkurt, G. A. Burns, M. P. Young, and R. Kotter, "Advanced database methodology for the Collation of Connectivity data on the Macaque brain (CoCoMac)," *Philos Trans R Soc Lond B Biol Sci*, vol. 356, no. 1412, pp. 1159–1186, 2001.
24. G. Burns, "Knowledge Mechanics and the NeuroScholar Project: A New Approach to Neuroscientific Theory," in *Computing the Brain, A guide to Neuroinformatics*, M. A. Arbib and J. Grethe, Eds. San Diego: Academic Press, 2001, pp. 319–335.
25. G. A. Burns and M. P. Young, "Analysis of the connectional organization of neural systems associated with the hippocampus in rats," *Philos. Trans. R. Soc. Lond., B, Biol. Sci.*, vol. 355, no. 1393, pp. 55–70, Jan. 2000. [Online]. Available: <http://www.ncbi.nlm.nih.gov/pubmed/10703044>
26. K. E. Stephan, C. C. Hilgetag, G. A. Burns, M. A. O'Neill, M. P. Young, and R. Kotter, "Computational analysis of functional connectivity between areas of primate cerebral cortex," *Philos Trans R Soc Lond B Biol Sci*, vol. 355, no. 1393, pp. 111–126, 2000.
27. C. C. Hilgetag, G. A. Burns, M. A. O'Neill, J. W. Scannell, and M. P. Young, "Anatomical connectivity defines the organization of clusters of cortical areas in the macaque monkey and the cat," *Philos Trans R Soc Lond B Biol Sci*, vol. 355, no. 1393, pp. 91–110, 2000.
28. G. Burns, "Neuroscholar 1.00, a neuroinformatics databasing website," *Neurocomputing*, vol. 26-27, pp. 963–970, 1999.
29. J. W. Scannell, G. A. Burns, C. C. Hilgetag, M. A. O'Neil, and M. P. Young, "The connectional organization of the cortico-thalamic system of the cat," *Cereb Cortex*, vol. 9, no. 3, pp. 277–299, 1999.
30. M. P. Young, J. W. Scannell, M. A. O'Neill, C. C. Hilgetag, G. Burns, and C. Blakemore, "Non-metric multidimensional scaling in the analysis of neuroanatomical connection data and the organization of the primate cortical visual system," *Philos Trans R Soc Lond B Biol Sci*, vol. 348, no. 1325, pp. 281–308, 1995.
31. M. P. Young, J. W. Scannell, G. A. Burns, and C. Blakemore, "Analysis of connectivity: neural systems in the cerebral cortex," *Rev Neurosci*, vol. 5, no. 3, pp. 227–250, 1994.

## Books, Chapters and Theses

1. G. A. P. C. Burns, D. Feng, and E. H. Hovy, "Intelligent Approaches to Mining the Primary Research Literature: Techniques, Systems, and Examples," in *Computational Intelligence in Medical Informatics*, A. Kelemen, A. Abraham, Y. Chen, and Y. Liang, Eds. Springer, 2008.
2. G. A. Burns, "Knowledge management of the neuroscientific literature: the data model and underlying strategy of the NeuroScholar system," *Philos Trans R Soc Lond B Biol Sci*, vol. 356, no. 1412, pp. 1187–1208, 2001.
3. A. E. Dashti, G. A. P. C. Burns, D. M. Simmons, L. Swanson, S. Ghandeharizadeh, C. Shahabi, J. Stone, and S. Jia, "The Neuroanatomical Rat Brain Viewer (NeuARt)," in *Computing the Brain: A Guide to Neuroinformatics*, J. S. Grethe and M. A. Arbib, Eds. San Diego: Academic Press, 2001, pp. 189–202.
4. G. Burns, "Neural connectivity in the rat: theory, methods and applications," D.Phil., Oxford University, 1997.
5. M. P. Young, J. W. Scannell, and G. A. P. C. Burns, *The analysis of cortical connectivity*. Austin, Texas: R. G. Landes, 1995.

## Posters, Abstracts

1. G. A. Burns, A. Hernandez, and A.M. Khan, "Curating Central Injection Studies from the Literature Using a General Purpose Knowledge Management Strategy," in *Annual Meeting for the Society for Neuroscience*, San Diego, 2016. [Online]. Available: <https://f1000research.com/posters/5-2849>
2. Marcelo Tallis, Chin Hua Kong, Katy Borner, and Gully APC Burns, "Automatic Derivation of Topic Maps from Neuroscientific Publications," in *INCF 2013*, 2013.
3. G. A. Burns and J. A. Turner, "Bottom-up curation of terminology for experimental variables: the Ontology of Experimental Variables and Values (OoEVV)," in *Bio-Ontologies SIG, ISMB*, 2012.
4. D. Dave, C. Ramakrishnan, and G. A. Burns, "Development of curation tools for making connections between observations and interpretations through experimental designs," in *Biocuration*, 2012.
5. G. Burns, *Structured nanopublications pertaining to the drugome: A Knowledge Engineering from Experimental Design (KEfED) model*, 2011. [Online]. Available: <http://www.youtube.com/watch?v=-xXF9-maxtw>
6. G. Burns, M. Tallis, and J. A. Turner, "Modeling Neuroanatomical Spatial Data Using the Ontology of Experimental Variables and Values (OoEVV)," Munich, Germany, 2012.

7. G. A. Burns and D. Dave, "A lightweight Ontology Design Pattern to curate and represent experimental variables from vaccine protection studies." in *Vaccine and Drug Ontology in the Study of Mechanism and Effect, ICBO 2012*, 2012.
8. G. A. P. C. Burns, M. Krallinger, K. B. Cohen, C. H. Wu, and L. Hirschman, "Biocuration Workflow Catalogue - Text Mining for the Biocuration Workflow," in *3rd International Biocurators Meeting*, Berlin, 2009.
9. G. Burns and T. Russ, "Biomedical Knowledge Engineering tools based on Experimental Design: a case study based on neuroanatomical tract-tracing experiments," in *KCAP 2009*, Long Beach CA, 2009.
10. G. Burns, T. Russ, T. Ingulfsen, A. M. Khan, and E. Hovy, "Using Knowledge Engineering Approaches to Reason About Neuroanatomical Experiments," in *Society for Neuroscience Annual Meeting*, Chicago, IL, 2009.
11. B. W. Herr, E. M. Talley, G. A. P. C. Burns, D. Newman, and G. LaRowe, "The NIH Visual Browser: An Interactive Visualization of Biomedical Research," in *13th International Conference on Information Visualization (IV09)*, Barcelona, Spain, 2009.
12. G. Burns, E. Hovy, and T. Ingulfsen, "Biomedical knowledge engineering approaches driven by processing the primary experimental literature." in *Frontiers in Neuroinformatics. Conference Abstract: Neuroinformatics 2008*, Stockholm, Sweden, 2008.
13. G. A. Burns, D. Newman, B. Herr, A. Holloway, P. Smyth, and K. Borner, "Analyses over multiple scientific text corpora: combining MEDLINE, CRISP and the proceedings of the annual meetings of the Society for Neuroscience." Annual Meeting for the Society for Neuroscience: Sfn, 2008.
14. G. Burns, B. Herr, D. Newman, T. Ingulfsen, P. Pantel, and P. Smyth, "A snapshot of neuroscience: unsupervised natural language processing of abstracts from the Society for Neuroscience 2006 annual meeting," in *Annual Meeting of the Society for Neuroscience*, San Diego, 2007, p. 100.6 / XX26. [Online]. Available: <http://f1000.com/posters/browse/summary/1092223>
15. G. Burns and E. Hovy, "The NeuroScholar system as a Natural Language Processing platform for the neuroscience literature," in *Annual Meeting of the Society for Neuroscience*, Atlanta, GA, 2006.
16. G. Burns, "Extracting and managing model parameters from the literature." in *World Association of Modellers, Biologically Accurate Modeling*, San Antonio, TX, 2005.
17. G. Burns and A. M. Khan, "An example of a neuroinformatics knowledge model derived from the primary literature: Catecholaminergic regulation of hypothalamic paraventricular neuroendocrine neurons," in *Annual Meeting for the Society for Neuroscience*, New Orleans, LA, 2003, p. 758.2.
18. G. A. P. C. Burns, T. Ingulfsen, D. Feng, and E. H. Hovy, "Using large-scale semi-automated information extraction for the biocuration of experimental observations:

the million-paper challenge." in *2nd International Biocurators meeting*, San Jose, CA, 2007.

19. G. Burns, A. M. Khan, W.-C. Cheng, and A. G. Watts, "A computational knowledge representation for physiological experiments with direct links to the primary literature and raw data," in *Annual Meeting of the Society for Neuroscience*, Washington, DC, 2005.
20. W.-C. Cheng, G. A. P. C. Burns, R. H. Thompson, and L. W. Swanson, "Tools for knowledge representation, acquisition and retrieval of neuroanatomical data mapped onto a standard atlas." in *Annual Meeting of the Society for Neuroscience*, Washington D.C., 2005, p. 571.4.
21. G. Burns, A. M. Khan, W. C. Cheng, and A. G. Watts, "A 'Stress Management' System: Computational knowledge representation of experiments that delineate neural circuits and histochemical expression patterns based on the primary literature and raw data," in *2005 Workshop on the Neuroendocrinology of Stress*, San Diego, 2005.
22. Y.-S. Chen, C. Shahabi, and G. Burns, "Two-phase Decision Fusion Based on User Preference," in *Hawaii International Conference on Computer Sciences*, Honolulu Hawaii, 2004.
23. A. M. Khan, W. C. Cheng, A. G. Watts, and G. Burns, "Histochemical studies of stress-activated paraventricular hypothalamic neuroendocrine neurons: a neuroinformatics-based digital lab notebook to relate the primary literature to raw, unpublished data," in *Society for Neuroscience Annual Meeting*, San Diego, 2004.
24. G. Burns, W.-C. Cheng, N. Zhang, and S. Ghandeharizadeh, "Web services as tools within a scientific knowledge engineering environment," in *SCI*, Miami FL., 2003.
25. S. Song, K. Chan, A. Golypayegani, S. Ghandeharizadeh, C. Shahabi, and G. Burns, "Tools for knowledge management of the neuroscientific literature, plugins for the NeuroScholar system," in *Computational Neuroscience*, Chicago, IL, 2003.