Chris A. Rishel

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Appointments

2022–present **Clinical Assistant Professor**, *Anesthesiology, Perioperative and Pain Medicine at Stanford University*.

2019–present **Editor-in-Chief, Co-Founder, Chief Technology Officer**, *WikiAnesthesia*.

Education and Training

2021–2022 **Clinical Scholar**, *Fellowship in Neurosurgical Anesthesia at Stanford University*.

2019–2021 **Clinical Instructor**, *Anesthesiology at Stanford University*.

2019–2021 **Research Fellowship**, *Fellowship in Anesthesia Research and Medicine at Stanford University*.

2016–2019 **Residency**, *Anesthesiology at Stanford University*.

2015–2016 **Internship**, *Internal Medicine at The University of Chicago*.

2007–2015 **M.D.**, *The Pritzker School of Medicine at The University of Chicago*.

2008–2012 **Ph.D. in Computational Neuroscience**, *The Committee on Computational Neuroscience at The University of Chicago*, 3.85/4.00.

- The committee award for outstanding performance in computational neuroscience

2003–2007 **B.S. in Computer Science**, *The College of Engineering at The University of Illinois at Urbana-Champaign*, 3.80/4.00.

- Graduated with Highest Honors

2003–2007 **B.S. in Chemistry**, *The College of Liberal Arts & Sciences at The University of Illinois at Urbana-Champaign*, 3.80/4.00.

- Graduated Cum Laude

Ph.D. Thesis

Title *Interactions between cognitive and spatial signals in parietal cortex*

Advisor David J. Freedman

Summary The posterior parietal cortex plays a central role in spatial functions, such as spatial attention and saccadic eye movements. However, recent work has increasingly focused on the role of parietal cortex in encoding nonspatial cognitive factors such as visual categories, learned stimulus associations, and task rules. The relationship between spatial encoding and nonspatial cognitive signals in parietal cortex, and whether cognitive signals are robustly encoded in the presence of strong spatial neuronal responses, is unknown. My work directly compared nonspatial cognitive and spatial encoding in the lateral intraparietal (LIP) area by training monkeys to perform a visual categorization task during which they made saccades toward or away from LIP response fields (RFs). This revealed that strong saccade-related responses minimally influence robustly encoded category signals in LIP, suggesting that cognitive and spatial signals are encoded independently in LIP and underscoring the role of parietal cortex in nonspatial cognitive functions.

Research Experience

2019–2021 **Postdoctoral fellow**, Stanford University.

2016–2019 **Resident physician**, Stanford University.

2008–2012 **Ph.D. Student**, *Laboratory of David J. Freedman*, The University of Chicago.

2004–2007 **Lead Developer**, *The University of Illinois Archives*, The University of Illinois at Urbana-Champaign.

Worked with The University Archives as the founding/lead developer on the award-winning *Archon Project*. Archon was developed to be an open-source, flexible, intuitive content management system to allow archival institutions to make information about their collections readily available to researchers through any web browser.

Teaching Experience

Winter 2009 **Teaching Assistant**, *Mathematical and Statistical Methods for Neuroscience II*, The University of Chicago, prof. Wim van Drongelen.

Duties included grading homeworks, running weekly discussion sections, giving a lecture, running a lab session, grading exams, and designing a programming problem for the take-home final exam which required students to filter, detect, and sort spikes from multiunit data.

Fall 2008 **Teaching Assistant**, *Mathematical and Statistical Methods for Neuroscience I*, The University of Chicago, prof. Wim van Drongelen.

Similar duties to the winter quarter course.

2006–2007 **MCAT Teacher**, *Kaplan Test Prep*, Champaign, IL.

Responsible for teaching two to three three-hour classes per week, as well as providing out-of-class help to prepare students to excel on the MCAT (Medical College Admission Test).

Vocational Experience

2009–2016 **Webmaster**, *The Department of Neuroscience*, Chicago, IL.
Responsible for customizing and deploying a database-driven content management system (Archon) for the departmental website. Created a system that allowed faculty and students to maintain their online profiles describing their research and publications.

2003–2007 **Systems Administrator**, *The University of Illinois Bands*, Champaign, IL.
Responsible for assuring the integrity and functionality of all servers and workstations on the department's network. Consulted with staff to design solutions to advance the department's technical resources and oversaw their implementation.

2000–2003 **Senior Web Developer**, *Motion Internet/Hanson Information Systems*, Springfield, IL.
Responsible for overseeing web development for contracted clients and in-house use. Developed a web application that integrated internal authentication and accounting severs and external network providers, allowing employees and customers to efficiently manage subscriber accounts.

Honors and Awards

2019 Resident Research Award, *Stanford Anesthesia Residency*.

2019 Best Clinical Research, *Stanford Anesthesia Research Awards Dinner*.

2018 G. Brant Walton Resident Award for Teaching Excellence, *Stanford Anesthesia Residency*.

2018 3rd place oral presentation, *Western Anesthesia Residents Conference*.

2016 Choosing Wisely Challenge Winner, *University of Chicago Medicine*.

2015 Campus Life and Leadership Award, *University of Chicago Center for Leadership and Involvement*.

2014 Naomi Ragins-Goldsmith Career Development Award, *University of Chicago Medical Scientist Training Program*.

2013 The Committee Award for Outstanding Performance in Computational Neuroscience, *University of Chicago*.

2008 Mellon Award for Technology Collaboration, *Andrew W. Mellon Foundation*.

2007-2015 Trainee, *National Institutes of Health Medical Scientist Training Program*.

2007 Graduated with Highest Honors in Computer Science, *University of Illinois at Urbana-Champaign*.

2007 Graduated Cum Laude in Chemistry, *University of Illinois at Urbana-Champaign*.

Professional Memberships

- American Medical Association
- American Society of Anesthesiologists
- American Society of Composers, Authors and Publishers
- Society for Education in Anesthesia
- Society for Neuroscience
- Society for Neuroscience in Anesthesia and Critical Care
- Society for Technology in Anesthesia

Technical Skills

Languages: ASP, C, C++, CSS, HTML, Java, JavaScript, LaTeX, Mathematica, MATLAB, Node.js, PHP, Perl, Python, R, React Native, Visual Basic, Visual C++

Database Platforms: Microsoft SQL Server, MySQL, PostgreSQL, SQLite, Realm

Interests

2007-2013 **Music Director, Album Producer**, *Voices in Your Head (A Cappella Group)*, The University of Chicago.

In the fall of 2007, Voices in Your Head was unknown beyond the University of Chicago campus. Through my directing, arranging, composing, album production, and mentorship to the group's future leaders, the group has become one of the most prominent collegiate a cappella groups in the world. During my tenure of leadership, both my individual work and the group have won numerous awards and compilation appearances at the international level.

- 2 nominations (1 win, 1 runner-up) for the Contemporary A Cappella Recording Award (CARA) for Best Professional Arrangement for a Scholastic Group (2015, 2016).
- 2-time winner of the CARA for Best Mixed Collegiate Arrangement (2012, 2013).
- 4 nominations (2 wins) for the CARA for Best Scholastic Original Song (2011, 2012, 2013).
- 3 nominations (1 win, 2 runner-ups) for the CARA for Best Mixed Collegiate Song (2012, 2013, 2015).
- 3-time winner of the Outstanding Arrangement award at the International Championship of Collegiate A Cappella.
- Recordings I have arranged and produced have been featured on (inter)national compilation albums 22 times between 2008 and 2016.
- Frequent lecturer and clinician at national a cappella festivals (SoJam, BOSS, ACappellaFest).

Peer-reviewed publications

1. Sun EC, Rishel CA, and Jena AB. Association Between Changes in Postoperative Opioid Utilization and Long-Term Healthcare Spending Among Surgical Patients with Chronic Opioid Utilization. Anesthesia & Analgesia 2022;134:515–23.
2. Sun EC, Rishel CA, Waljee JF, and Brummett CM. Association Between State Limits on Opioid Prescribing and the Incidence of Persistent Postoperative Opioid Use Among Surgical Patients. Annals of Surgery 2021.
3. Rishel CA, Angst MS, and Sun EC. Preoperative opioid utilization patterns and postoperative opioid utilization after surgery: A retrospective cohort study. Anesthesiology 2021;135:1015–26.
4. Rishel CA, Zhang Y, and Sun EC. Association between Preoperative Benzodiazepine Use and Postoperative Opioid Use and Healthcare Costs. JAMA Network Open 2020;3.
5. Sun E, Mello MM, Rishel CA, Vaughn MT, Kheterpal S, Saager L, Fleisher LA, Damrose EJ, Kadry B, Jena AB, and Multicenter Perioperative Outcomes Group (MPOG). Association of Overlapping Surgery With Perioperative Outcomes. JAMA 2019;321:762–72.
6. Sun E, Moshfegh J, Rishel CA, Cook CE, Goode AP, and George SZ. Association of Early Physical Therapy With Long-term Opioid Use Among Opioid-Naive Patients With Musculoskeletal Pain. JAMA Network Open 2018;1:1–11.
7. Rishel CA, Huang G, and Freedman DJ. Independent category and spatial encoding in parietal cortex. Neuron 2013;77:969–79.
8. Schwartz SW, Prom CJ, Rishel CA, and Fox KJ. Archon: A unified information storage and retrieval system for lone archivists, special collections librarians and curators. Partnership: The Canadian Journal of Library and Information Practice and Research 2007;2.

Book chapters

1. Schwartz SW, Prom CJ, Rishel CA, and Fox KJ. Archon: A unified information storage and retrieval system for lone archivists, special collections librarians and curators. In: *Preservation and Archiving: Challenges & Solutions*. Ed. by McIntosh J. 1st ed. Apple Academic Press, 2011. Chap. 3:35–49.

Grand rounds and invited lectures

1. Rishel CA and Larson BJ. WikiAnesthesia: Creating a crowd-sourced repository of anesthesia knowledge. Stanford Anesthesiology, Perioperative and Pain Medicine Grand Rounds. Stanford, CA, 2021.

Peer-reviewed conference proceedings

1. Du A, Rishel CA, and Sun EC. Impact of naloxone co-prescription mandates on post-operative outcomes. In: *American Society of Anesthesiologists*. San Diego, CA, 2021.
2. Rishel CA, Shah S, Zhang Y, Darnall BD, and Sun EC. Association between the Number of Prescribers of Concurrent Opioid and Benzodiazepine Medications and the Risk of Overdose: A Retrospective Analysis. In: *Association of University Anethesiologists*. Virtual conference, 2021.
3. Rishel CA, Shah S, Zhang Y, Darnall BD, and Sun EC. Association between the Number of Prescribers of Concurrent Opioid and Benzodiazepine Medications and the Risk of Overdose: A Retrospective Analysis. In: *International Anesthesia Research Society*. Virtual conference, 2021.
4. Rishel CA, Angst MS, and Sun EC. Association between the Trajectory of Preoperative Opioid Use and Postoperative Opioid Use, Adverse Events, and Economic Outcomes: A Retrospective Analysis. In: *International Anesthesia Research Society*. San Francisco, CA, 2020 (Conference canceled).

5. Larson BJ and Rishel CA. A Novel Web-Based Platform for Anesthetic Innovation and Education. In: *Society for Technology in Anesthesia Annual Meeting*. Austin, TX, 2020.
6. Rishel CA, Angst MS, and Sun EC. Association between Preoperative Opioid Weaning and Subsequent Long-term Opioid Use: A Retrospective Analysis. In: *Association of University Anesthesiologists*. Montreal, Quebec, 2019.
7. Black A, Rishel CA, and Rao VK. Frequency of LVAD pump thrombus after Factor Eight Inhibitor Bypass Activity (FEIBA) administration during LVAD implantation. In: *Society of Cardiovascular Anesthesiologists Annual Meeting*. Chicago, IL, 2019.
8. Black A, Rishel CA, and Rao VK. Frequency of LVAD pump thrombus after Factor Eight Inhibitor Bypass Activity (FEIBA) administration during LVAD implantation. In: *Western Anesthesia Residents Conference Abstracts*. Denver, CO, 2019.
9. Rishel CA, Angst MS, and Sun EC. Association between preoperative opioid weaning and postoperative outcomes among chronic opioid users: a retrospective analysis. In: *Western Anesthesia Residents Conference Abstracts*. San Diego, CA, 2018.
10. Rishel CA, Huang G, and Freedman DJ. Interactions between spatial and non-spatial encoding in parietal cortex during visual categorization. In: *Society for Neuroscience Abstracts 2011*. Washington, DC, 2011.
11. Rishel CA and Freedman DJ. The influence of saccades on visual feature selectivity in parietal cortex during a visual matching task. In: *Society for Neuroscience Abstracts 2010*. San Diego, CA, 2010.
12. Swaminathan SK, McClellan S, Rishel CA, and Freedman DJ. A comparison of prefrontal and parietal cortices during visual motion categorization. In: *Society for Neuroscience Abstracts 2009*. Chicago, IL, 2009.
13. Prom CJ, Rishel CA, Schwartz SW, and Fox KJ. A unified platform for archival description and access. In: *Proceedings of the 7th ACM/IEEE-CS joint conference on Digital Libraries*. ACM, 2007:157–66.
14. Prom CJ, Schwartz SW, and Rishel CA. Developing an Open-source and Standards-Compliant Descriptive Tool for Lone Arrangers. In: *Society of American Archivists Annual Meeting*. Washington, DC, 2006.