

CURRICULUM VITAE

GENERAL INFORMATION

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PERSONAL STATEMENT

I am interested in using detailed, large-scale models to improve our understanding of how complex systems behave. In neuroscience, this entails using biomimetic network models to explain the computations performed by the sensorimotor system. In epidemiology, it involves the development of HIV transmission models to predict the optimal allocation of resources. In addition to modeling, I have a strong interest in developing new mathematical and computational methods, including optimization algorithms and approaches for quantifying nonparametric distributions. Finally, I am mildly obsessed with the aesthetics of presentation, and aim to create elegant figures and compelling writing.

ACADEMIC AND INDUSTRY EXPERIENCE

- ❖ **Discovery Early Career Research Fellow, University of Sydney School of Physics (2014–present)**
 - Beginning September 2014, I will be investigating how large-scale brain rhythms influence and facilitate information processing, particularly motor control, among small networks of individual neurons. The research questions will be addressed by combining detailed computer simulations with data-driven analyses of empirical human and monkey brain dynamics. The outcomes of this project will provide a richer understanding of how our brains encode and process information, leading to practical benefits such as improved control of artificial limbs.
- ❖ **Postdoctoral Fellow, Neurosimulation Laboratory, State University of New York Downstate Medical Center (2010–present)**
 - I work on large-scale spiking neuron models as part of the Defense Advanced Research Project Agency's \$15 million “Reorganization and Plasticity to Accelerate Injury Recovery” (REPAIR) project. I collaborate closely with experimentalists in nonhuman primate electrophysiology and optogenetics, whose data are used to both build the model and test its predictions. The eventual aim is to create a functional human neuroprosthesis: a computer model of the sensorimotor system that engages in bidirectional communication with the brain, thereby restoring lost function. Further details are available from www.neurosimplab.org.
- ❖ **Senior Research Associate, Surveillance and Evaluation Program for Public Health, Kirby Institute, University of New South Wales (2010–present)**
 - I am the lead software developer for the group, responsible for overseeing the development of models of HIV transmission and disease progression, new statistical methodologies, and software for cost-effectiveness and health economic analyses. The deliverables of these projects typically consist of reports and graphical software interfaces designed to client specifications. Current and past clients include the World Health Organization, the World Bank, UNAIDS, and national ministries of health across Europe and Asia. Further details are available from www.natcent.unsw.edu.au/scpph.

- ❖ **Co-Director and Analyst, Cingulate Consulting** (2011–present)
 - I founded Cingulate Consulting to analyze private-sector datasets using detailed process models, data mining approaches, and other statistical methods. Our current clients include several major Australian retailers. In addition to data analysis and report writing, I manage a team of five other analysts. Further details are available from www.cingulate.com.au.
- ❖ **Research Associate, Complex Systems Group, University of Sydney School of Physics** (2010–2014)
 - This position involves research student supervision and the application neural field models to human EEG data, including the analysis of age trends and evoked potentials. It is a continuation of my Ph.D. work.
- ❖ **Scientific Consultant, Brain Resource Ltd.** (2010)
 - This position involved the analysis of a large dataset of structural, physiological, and behavioral measures of age trends in human subjects. It culminated in the design and production of two summary posters that have since been used in demonstrations of Brain Resource’s capabilities to prospective clients.

ACADEMIC QUALIFICATIONS

- ❖ **Doctor of Philosophy** in Complex Systems, School of Physics, University of Sydney (2006–2010)
 - Thesis title: “Modeling and Quantification of Auditory Evoked Potentials”; available from www.neurosimlab.org/cliffk/thesis.pdf
- ❖ **Diploma of Arts in Music** (with Merit), Sydney Conservatorium of Music (2006–2008)
 - Received the highest possible mark (99) for MUSC2614, “Composition Workshop”
- ❖ **Bachelor of Science in Physics with Honours** (Class I), University of Sydney (2005)
 - Thesis title: “Physiology-Based Modeling of Evoked Response Potentials”
- ❖ **Bachelor of Science in Neuroscience/Biophysics**, University of Queensland (2002–2004)

ACADEMIC TEACHING EXPERIENCE

- ❖ Ph.D. student co-supervisor (2011–2013; University of New South Wales, in epidemiology)
- ❖ NEURON software tutor, *Advanced Course in Computational Neuroscience* (2013; Będlewo, Poland)
- ❖ Lecturer, *Computational Science* first-year course (2nd semester 2012, University of Sydney)
 - Received an overall feedback score of 4.4/5; sample student comments: “Cliff is a fantastic lecturer – very clear & easy to follow. Very interactive & lots of demonstration. Thanks!”; “Supremely clear, intuitive explanations. Connected content to genuine applications, made the material seem relevant and interesting. Showed a genuine interest in the material himself. These are the best lectures I’ve yet attended, I can’t think of what to improve.”
- ❖ Honours (4th-year) student co-supervisor (2012; University of Sydney, in brain dynamics)
- ❖ Faculty of Science mentor for new tutors and demonstrators (2011–present)
- ❖ Guest lecturer, *Neurodynamics* Honours course, University of Sydney (2011)
- ❖ Instructor for postgraduate *Computation and Image Processing* lab, University of Sydney (2010)
- ❖ Supervisor for first-year physics tutorials, University of Sydney (2006–2010)
- ❖ Demonstrator for second-year physics labs, University of Sydney (2006–2010)
- ❖ Supervisor for first-year physics labs, University of Sydney (2008)
- ❖ Tutor for first-year physics tutorials, University of Sydney (2005–2006)
- ❖ Tutor for first-year biology, biochemistry, and physics, University of Queensland (2003–2004)

PUBLICATIONS

Peer-reviewed papers and full-length proceedings

1. Lytton WW, Neymotin SA, **Kerr CC** (in press; accepted 02/02/2014). Multiscale modeling for clinical translation in neuropsychiatric disease. *Journal of Computational Surgery*.
2. Chadderdon GL, Mohan A, Suter BA, Neymotin SA, **Kerr CC**, Francis JT, Shepherd GMG, Lytton WW (in press; accepted 02/02/2014). Motor cortex microcircuit simulation based on brain activity mapping. *Neural Computation*.
3. Jansson JA, **Kerr CC**, Wilson DP (in press; accepted 30/10/2013). Predicting the population impact of increased HIV testing and treatment in Australia. *Sexual Health*.
4. Eaton JW, Menzies NA, Stover J, Cambiano V, Chindelevitch L, Cori A, Hontelez JAC, Humair S, **Kerr CC**, Klein DJ, Mishra S, Mitchell KM, Nichols BE, Vickerman P, Bärnighausen T, Bershteyn A, Bloom DE, Boily M-C, Chang ST, Cohen T, Dodd PJ, Fraser C, Gopalappa C, Lundgren J, Martin NK, Mountain E, Pham QD, Pickles M, Phillips A, Platt L, Pretorius C, Prudden HJ, Salomon JA, van de Vijver DAMC, Wagner BG, White RG, Wilson DP, Zhang L, Bandford J, Meyer-Rath G, Remme M, Revill P, Sangruejee N, Terris-Prestholt F, Doherty M, Easterbrook P, Hirschall G, Hallett TB (2014). How should programs respond to evidence for the benefits of earlier ART initiation? A combined analysis of twelve mathematical models. *The Lancet Global Health* **2**:e23–34.
5. Neymotin SA, Chadderdon GL, **Kerr CC**, Francis JT, Lytton WW (2013). Reinforcement learning of 2-joint virtual arm reaching in a computer model of sensorimotor cortex. *Neural Computation* **25**(12):3263–93.
6. **Kerr CC**, van Albada SJ, Neymotin SA, Chadderdon GL, Robinson PA, Lytton WW (2013). Cortical information flow in Parkinson's disease: a composite network/field model. *Frontiers in Computational Neuroscience* **7**(39):1–14.
7. Song W, **Kerr CC**, Lytton WW, Francis JT (2013). Cortical plasticity induced by spike-triggered microstimulation in primate somatosensory cortex. *PLOS ONE* **8**(3):e57453.
8. Kwon JA, Anderson J, **Kerr CC**, Thein H-H, Zhang L, Iversen J, Dore GJ, Kaldor JM, Law MG, Maher L, Wilson D (2012). Estimating the cost-effectiveness of needle-syringe programs in Australia. *AIDS* **26**(17):2201–10.
9. Chadderdon GL, Neymotin SA, **Kerr CC**, Lytton WW (2012). Reinforcement learning of targeted movement in a spiking neuronal model of motor cortex. *PLOS ONE* **7**(10):e47251.
10. **Kerr CC**, Neymotin SA, Chadderdon GL, Fietkiewicz CT, Francis JT, Lytton WW (2012). Electrostimulation as a prosthesis for repair of information flow in a computer model of neocortex. *IEEE Transactions on Neural Systems & Rehabilitation Engineering* **20**(2):153–60.
11. Neymotin SA, **Kerr CC**, Francis JT, Lytton WW (2011). Training oscillatory dynamics with spike-timing-dependent plasticity in a computer model of neocortex. *IEEE Signal Processing in Medicine and Biology Symposium* 1–6.
12. Schneider K, **Kerr CC**, Hoare A, Wilson DP (2011). Expected epidemiological impacts of introducing an HIV vaccine in Thailand: a model-based analysis. *Vaccine* **29**(36): 6086–91.
13. Chiang AK, Rennie CJ, Robinson PA, van Albada SJ, **Kerr CC** (2011). Age trends and sex differences of alpha rhythms including split alpha peaks. *Clinical Neurophysiology* **122**(8):1505–17.
14. **Kerr CC**, Rennie CJ, Robinson PA (2011). Model-based analysis and quantification of auditory evoked potential age trends. *Clinical Neurophysiology* **122**(1):134–47.
15. **Kerr CC**, Kemp AH, Rennie CJ, Robinson PA (2011). Thalamocortical changes in clinical depression probed by deconvolution and physiology-based modeling. *NeuroImage* **54**(4):2672–82.
16. **Kerr CC**, van Albada SJ, Rennie CJ, Robinson PA (2010). Age trends in auditory evoked potentials via component scoring and deconvolution. *Clinical Neurophysiology* **121**(6):962–76.
17. Van Albada SJ, **Kerr CC**, Chiang AK, Rennie CJ, Robinson PA (2010). Neurophysiological changes with age probed by inverse modeling of EEG spectra. *Clinical Neurophysiology* **121**(1):21–38.

18. **Kerr CC**, Rennie CJ, Robinson PA (2009). Deconvolution analysis of target evoked potentials. *Journal of Neuroscience Methods* **179**(1):101–110.
19. Clearwater JC, **Kerr CC**, Rennie CJ, Robinson PA (2008). The neural mechanisms of ERP change: combining insights from electrophysiology and mathematical modeling. *Journal of Integrative Neuroscience* **7**(4):529–50.
20. **Kerr CC**, Rennie CJ, Robinson PA (2008). Physiology-based modeling of cortical auditory evoked potentials. *Biological Cybernetics* **98**(2):171–84.

Submitted manuscripts

1. Wilson DP, Zhang L, **Kerr CC**, Uusküla A, Kwon JA, Hoare A, et al. (submitted to *PLOS Medicine* on 8/1/2014). Needle-syringe programs are cost-effective in Eastern Europe and Central Asia: costing, data synthesis, modeling and economics for eight case study countries.

Books and book chapters

1. Lytton WW, **Kerr CC** (2013). Computational neuroscience of synapses and neurons. In Pfaff D (ed.), *Neuroscience in the 21st Century*. Berlin: Springer Verlag.
2. Neymotin SA, Mathew A, **Kerr CC**, Lytton WW (2013). Computational neuroscience of neural networks. In Pfaff D (ed.), *Neuroscience in the 21st Century*. Berlin: Springer Verlag.
3. Wilson DP, Riono P, **Kerr CC**, Kwon JA, Zhang L, Kaldor J, Sutrisna A, Farid MN, Hadi N (2011). *The HIV in Indonesia Model (HIM)*. Jakarta: University of Indonesia Press.

Technical reports

1. Wilson DP, Yakusik A, **Kerr CC**, Avila C (2013). *HIV resource needs, efficient allocation and resource mobilization for the Republic of Belarus: Report for UNAIDS*.
2. Zhang L, Pham QD, Do MH, **Kerr CC**, Wilson DP (2012). *Return on Investment of HIV Prevention in Vietnam: Technical Report for the World Bank and Vietnam Administration for AIDS Control*.
3. Wilson DP, Reyes J, **Kerr CC**, Gray RT (2012). *Return on Investment of Needle-Syringe Programs in the Philippines: Report for the World Bank*.
4. Wilson DP, Gray RT, Razali K, Hoare A, Cheah J, **Kerr CC**, Jamaludin A (2012). *Determining Cost-Effective and Efficient Allocation of HIV Resources for the Republic of Armenia: Report for the World Bank*.
5. Wilson DP, Zhang L, **Kerr CC**, Kwon JA, Hoare A, Avila C, Williams-Sherlock M (2011). *Evaluating the Cost-Effectiveness of Needle-Syringe Exchange Programs in Europe and Central Asia: Report for UNAIDS*.

Conferences and conference proceedings

1. **Kerr CC**, Choi JS, Dura-Bernal S, Francis JT, Lytton WW (submitted). One size does not fit all: calibrating microstimulation to individual subjects using spiking network models. *Society for Neuroscience*.
2. Dura-Bernal S, Li K, Brockmeier A, **Kerr CC**, Neymotin SA, Principe JC, Francis JT, Lytton WW (submitted). Repairing lesions via microstimulation in a spiking network model driving a virtual arm. *Society for Neuroscience*.
3. **Kerr CC**, O'Shea DJ, Goo W, Dura-Bernal S, Francis JT, Diester I, Kalanithi P, Deisseroth K, Shenoy K, Lytton WW (forthcoming). Network-level effects of optogenetic stimulation in a computer model of macaque primary motor cortex. *Computational Neuroscience*.
4. **Kerr CC**, O'Shea DJ, Goo W, Dura-Bernal S, Francis JT, Diester I, Kalanithi P, Deisseroth K, Shenoy K, Lytton WW (2014). Information flow in optogenetically stimulated macaque motor cortex: simulation and experiment. *Neural Control of Movement* (talk).

5. Francis JT, Iordanou J, **Kerr CC**, Lytton WW, von Kraus L (2014). Erasing sensorimotor memories II: The role of PKMzeta dependent LTP in S1 receptive fields and behavior in the experimentally naive rat and primate. *Neural Control of Movement* (talk).
6. **Kerr CC**, O'Shea DJ, Goo W, Dura-Bernal S, Francis JT, Diester I, Kalanithi P, Deisseroth K, Shenoy K, Lytton WW (2014). Network-level effects of optogenetic stimulation: experiment and simulation. *SUNY Downstate Medical Center Research Day* (talk)
7. **Kerr CC**, Pachitariu M, Iordanou J, Francis J, Sahani M, Lytton WW (2014). Low-dimensional dynamics of somatosensory cortex: experiment and simulation. *Computational and Systems Neuroscience* (poster).
8. Dura-Bernal S, Fox C, de Kamps M, Neymotin SA, **Kerr CC**, Francis JT, Shepherd GMG, Lytton WW (2014). Multiscale modeling of cortical microcircuits. *Intelligence Advanced Research Projects Agency (LARPA) Machine Intelligence from Cortical Networks (MICrONS)*.
9. **Kerr CC**, von Kraus L, Iordanou I, Neymotin SA, Francis JT, Lytton WW (2013). Receptive field formation and erasure in somatosensory cortex. *Society for Neuroscience* (poster).
10. **Kerr CC**, van Albada SJ, Neymotin SA, Chadderdon G, Robinson PA, Lytton WW (2013). Multiscale modeling of cortical information flow in Parkinson's disease. *Computational Neuroscience*.
11. Naning H, **Kerr CC**, Kamarulzaman A, Dahlui M, Ng CW, Wilson DP (2013). Return on Investment of HIV Harm Reduction Programmes for Injecting Drug Users in Malaysia. *International AIDS Society*.
12. Eaton JW, Menzies NA, Stover J, Cambiano V, Chindelevitch L, Cori A, Hontelez JAC, Humair S, **Kerr CC**, Klein DJ, Mishra S, Mitchell KM, Nichols BE, Vickerman P, Bärnighausen T, Bershteyn A, Bloom DE, Boily M-C, Chang ST, Cohen T, Dodd PJ, Fraser C, Gopalappa C, Lundgren J, Martin NK, Mountain E, Pham QD, Pickles M, Phillips A, Platt L, Pretorius C, Prudden HJ, Salomon JA, van de Vijver DAMC, Wagner BG, White RG, Wilson DP, Zhang L, Bandford J, Meyer-Rath G, Remme M, Revill P, Sangrujee N, Terris-Prestholt F, Doherty M, Easterbrook P, Hirschschall G, Hallett TB, on behalf of the HIV Modelling Consortium ART Eligibility Guidelines Working Group (2013). The epidemiological impact and cost-effectiveness of expanded eligibility for and access to adult antiretroviral therapy in South Africa, Zambia, India, and Vietnam: a twelve model analysis. *International AIDS Society*.
13. **Kerr CC**, van Albada SJ, Neymotin SA, Chadderdon G, Robinson PA, Lytton WW (2013). Multiscale modeling of cortical information flow in Parkinson's disease. *Information Processing in Cognition* (invited talk).
14. **Kerr CC**, van Albada SJ, Neymotin SA, Chadderdon G, Robinson PA, Lytton WW (2013). How Parkinson's disease affects cortical information flow: a multiscale model. *NeuroEng: Australian Workshop on Computational Neuroscience* (talk).
15. **Kerr CC**, van Albada SJ, Neymotin SA, Chadderdon G, Robinson PA, Lytton WW (2012). Wrong on so many levels: Parkinsonism in a multiscale network/field model. *BrainModes* (invited talk).
16. Jansson J, **Kerr CC**, Mallitt KA, Wu J, Gray RT, Wilson DP (2012). Inferring HIV incidence from CD4 at diagnosis: filling the surveillance gap. *Australasian Society for HIV Medicine* (talk).
17. Hoare A, Gray RT, Razali K, **Kerr CC**, Wilson DP (2012). Optimizing HIV budgets to maximize the impact of HIV prevention programs in an era of reduced funding. *Australasian Society for HIV Medicine* (talk).
18. Popovic G, Ward J, Wilson DP, **Kerr CC**, Gray RT (2012). An escalating HIV epidemic in Aboriginal and Torres Strait Islander people is unlikely, but vigilance is required. *Australasian Society for HIV Medicine* (talk).
19. **Kerr CC**, van Albada SJ, Neymotin SA, Chadderdon G, Robinson PA, Lytton WW (2012). Effects of basal ganglia on cortical computation: a hybrid network/neural field model. *Society for Neuroscience* (poster).

20. Neymotin SA, Chadderdon G, **Kerr CC**, Francis JT, Lytton WW (2012). Reinforcement learning of 2-joint virtual arm reaching in computer model of sensory and motor cortex. *Society for Neuroscience* (poster).
21. Chadderdon G, Neymotin SA, **Kerr CC**, Francis JT, Lytton WW (2012). Dopamine-based reinforcement learning of virtual arm reaching task in a spiking model of motor cortex. *Society for Neuroscience* (poster).
22. Neymotin SA, Chadderdon G, **Kerr CC**, Francis JT, Lytton WW (2012). Reinforcement learning of 2-joint virtual arm reaching in motor cortex simulation. *Computational Neuroscience* (poster).
23. Wilson DP, Zhang L, **Kerr CC**, Uusküla A, Kwon JA, Hoare A, et al. (2012). The cost-effectiveness of needle-syringe exchange programs in Eastern Europe and Central Asia: costing, data synthesis, modelling and economics for eight case study countries. *AIDS* (talk).
24. Kwon JA, Anderson J, **Kerr CC**, Thein H-H, Zhang L, Iversen J, Dore GJ, Kaldor JM, Law MG, Maher L, Wilson D (2012). Estimating the cost-effectiveness of needle-syringe programs in Australia. *AIDS* (poster).
25. Kwon JA, **Kerr CC**, Zhang L, Riono P, Farid MN, Sutrisna A, Hadi N, Wilson DP (2012). Estimating the population benefits of achieving universal coverage of antiretroviral therapy (ART) in Indonesia. *AIDS* (poster).
26. Chadderdon GL, Neymotin SA, **Kerr CC**, Francis JT, Lytton WW (2012). Dopamine-based reinforcement learning of virtual arm reaching task in a spiking model of motor cortex. *International Conference on Cognitive and Neural Systems 16* (poster).
27. Lytton WW, Neymotin SA, Chadderdon GL, **Kerr CC**, Francis JT (2012). Reinforcement learning of 2-joint virtual arm reaching in detailed cortex simulation. *Neural Control of Movement* (poster).
28. Schneider K, **Kerr CC**, Hoare A, Wilson DP (2011). Expected epidemiological impacts of introducing an HIV vaccine in Thailand: a model-based analysis. *Australasian Society for HIV Medicine* (poster).
29. **Kerr CC**, Neymotin SA, Mo J, Schroeder CE, Ding M, Lytton WW (2011). Interlaminar feedback connections dominate in macaque inferotemporal cortex: in vivo and in silico studies. *Society for Neuroscience* (poster).
30. Neymotin SA, **Kerr CC**, Francis JT, Lytton WW (2011). Attentional modulation of receptive fields in a computer model of the thalamocortical system. *Society for Neuroscience* (poster).
31. Neymotin SA, **Kerr CC**, Chadderdon G, Francis JT, Lytton WW (2011). Restoring physiological oscillations using neuroprosthetic spike-timing-dependent plasticity in computer model of neocortex. *Society for Neuroscience* (poster).
32. Schneider K, Hoare A, **Kerr CC**, Wilson DP (2011). Expected epidemiological impacts of introducing an HIV vaccine in Thailand: a model-based analysis. *10th International Congress on AIDS in Asia and the Pacific* (poster).
33. Neymotin SA, **Kerr CC**, Fietkiewicz CT, Chadderdon GL, Lytton WW (2011). Spike-timing-dependent plasticity and subcortical waves enhance alpha oscillations in a computer model of neocortex. *Neuroinformatics* (poster).
34. **Kerr CC**, Mo J, Neymotin SA, Ding M, Lytton WW (2011). Interlaminar Granger causality and alpha oscillations in a model of macaque cortex. *Computational Neuroscience* (poster).
35. **Kerr CC**, Fietkiewicz C, Chadderdon G, Neymotin SA, Lytton WW (2010). Development of In Silico Brain for DARPA REPAIR project. *DARPA Neural Science, Engineering, and Technology Meeting* (poster).
36. Robinson PA, Kim JW, **Kerr CC** (2010). Spatiotemporal characteristics of brain activity in attention-deficit hyperactivity children. *Human Brain Mapping* (poster).

37. **Kerr CC**, Kemp AH, Rennie CJ, Robinson PA (2010). Modeling evoked potentials in clinical depression. *Human Brain Mapping* (poster).
38. **Kerr CC**, Kemp AH, Rennie CJ, Robinson PA (2010). Thalamocortical changes in clinical depression probed by deconvolution and physiology-based modeling. *Computational and Systems Neuroscience* (poster)
39. **Kerr CC**, Rennie CJ, Robinson PA, Clearwater JC (2008). Physiology-based modeling and analysis of auditory evoked potentials. *Forum for European Neuroscience* (poster).
40. **Kerr CC** (2007). A novel method for analyzing target evoked potentials. *University of Sydney MedPhys* (talk).
41. **Kerr CC** (2006). Biophysical modeling of auditory evoked potentials. *University of Sydney MedPhys* (invited talk).
42. **Kerr CC**, Rennie CJ, Robinson PA (2006). Biophysical modeling of auditory evoked potentials. *Kolling Institute Annual Scientific Research Meeting* (poster).
43. **Kerr CC**, Rennie CJ, Robinson PA (2006). Physiology-based modeling and quantification of evoked response potentials. *Queensland Brain Institute Workshop on Mathematical and Computational Neuroscience* (poster).

NON-CONFERENCE INVITED TALKS

1. Kirby Institute, University of New South Wales (“Seminar Series”, February 2012)
2. Woolcock Institute of Medical Research (July 2010)
3. School of Physics, University of Sydney (“Complex Systems Seminar”, June 2010)
4. University of Sydney High Achievers’ Afternoon Tea (January 2010)
5. Brain Dynamics Centre, Westmead Hospital (June 2007, April 2008)
6. School of Physics, University of Sydney (“Colloquium”, August 2007)

COMPETITIVE RESEARCH GRANTS

- 1 **Kerr CC** (2014-2018). *The forest and the trees: How global brain rhythms facilitate local information processing*. Australian Research Council (ARC) Discovery Early Career Research Fellowship DE140101375 (AU\$570,360 total, including AU\$395,220 from the ARC and AU\$175,140 from the University of Sydney).
 - This is the most competitive support scheme for early-career researchers in Australia, with a success rate of 13.6%; it has been described by one Australian academic as “some of the toughest money to win – worldwide” (theconversation.com/centuries-wasted-applying-for-grants-13111).
- 2 Wilson DP, Zhang L, Gray RT, **Kerr CC**, Hoare A, Reyes J, Schneider K, Pham Q, Razali K, Chow E, Kwon JA, Anh D, Heymer K, Zhuang X, Farr C, Tapia M (2011-2013). *Cost-effectiveness of HIV prevention responses in Asia*. World Bank Assignment 1045478 (US\$1,898,242).
 - I had the lead role developing the modeling component of this contract (roughly 30% of the total).
- 3 State University of New York Downstate Medical Center (2012-2014). *Creating the synthetic brain through hybrid computational and biological systems: repairing and replacing neural networks*. Defense Advanced Research Projects Agency (DARPA) Contract N66001-10-C-2008 Phase II (US\$6,063,148).
 - No investigators were explicitly named on this contract, but I had the lead role in developing and writing the modeling component (roughly 10% of the total), so I would have been listed as a co-investigator if any had been named.

PERSONAL GRANTS AND SCHOLARSHIPS

- ❖ Winner, BRAINnet Challenge (2010)
 - Prize awarded for “the most innovative or pragmatic analysis method for evoked potential data from subjects with attention-deficit hyperactivity disorder”; the method received national media attention, including from the *Sydney Morning Herald* and Channel Ten’s *7PM Project*.
- ❖ Westmead Millennium Foundation Stipend Enhancement Grant (2008–2009)
- ❖ Forum for European Neuroscience Travel Grant (2008)
- ❖ Denison Award (2008)
- ❖ Postgraduate Research Support Scheme Travel Grant (2006, 2008)
- ❖ Australian Postgraduate Award (2006–2009)

IT EXPERIENCE

- ❖ Lead developer, *HIV in Indonesia Model*, *Cambodian HIV Evaluation Model*, and *Prevtool* (2010–present)
 - Interactive, MATLAB-based software packages for analyzing, forecasting, and visualizing HIV epidemics in Indonesia, Cambodia, and Eurasia, respectively. Software is available for download from www.natcent.unsw.edu.au/sepph/software.html.
- ❖ Co-developer, *Needle-Exchange Program Evaluation Model* (2011)
 - Details as above, except focused on Eastern European injecting drug users, and developed under the auspices of UNAIDS.
- ❖ Languages: MATLAB and Python (including parallel computing and graphical user interface design in each), NEURON, C, IDL, shell scripting
- ❖ Web design and hosting: HTML, PHP, and CSS (example designs include www.cingulate.com.au and www.neurosimplab.org); Apache and FTP server setup and administration
- ❖ Operating systems: Linux and Windows (plus basic familiarity with Apple)
- ❖ Programs: Microsoft Office (Word, Excel, PowerPoint), LaTeX, Emacs, version control (Mercurial, Git), Message Passing Interface (MPI), image and sound editing software (Photoshop, Illustrator, Inkscape, Goldwave, and others)

ACADEMIC SERVICE

- ❖ Reviewer for the following journals: *PLOS Computational Biology*, *PLOS ONE*, *Journal of Neurophysiology*, *Brain Research*, *Mathematical Biosciences*, *Epilepsy Research*, *Physical Review E*, *Journal of Neural Engineering*, and *Journal of Neuroscience Methods*
- ❖ Abstract reviewer for the *Computational Neuroscience* conference (2013)
- ❖ Program Committee member, *Workshop on Information Processing in Cognition*, Sydney, Australia (2013)

ACADEMIC AWARDS

- ❖ University of Queensland Dean’s Commendation for Academic Excellence for every semester (i.e., semesters 1 and 2 of 2002, 2003, and 2004)
- ❖ International House Academic Achievement Award (2003)

MUSIC QUALIFICATIONS, AWARDS, AND EXPERIENCE

Composition portfolio available upon request.

- ❖ Composer and pianist, *Spectrum Concert Series* (2014; performance at Spectrum in New York City)
- ❖ Artistic Director, Birubi Concert (2011–2013)
 - Position involved concert planning for a new organization dedicated to showcasing young classical performers; see www.birubiconcert.org for more information.

- ❖ Composer-in-Residence, Sydney Camerata Chamber Orchestra (2010)
 - Position involved writing new works for performance by an 18-member string orchestra.
- ❖ President, Sydney University Madrigal Society (2007)
 - Position involved directing all financial, administrative, and artistic decisions, as well as conducting rehearsals and performances, for a choir of about 40 members.
- ❖ Licentiate of Music Australia in piano (2003)
 - This is the second-highest qualification awarded by the Australian Music Examinations Board, and is considered to be roughly equivalent to a master's degree in piano performance.
- ❖ Associate of Music Australia in piano (2001)
- ❖ Composer, *When the Poet Met Music* (2013; performance at The Independent Theatre in Sydney, NSW)
- ❖ Composer, *Kammerklang: Worship the Machine* (2011)
- ❖ Composer and pianist, *Cliff Kerr in Recital* (2009–2010; five performances in Sydney, NSW; Brisbane, QLD; and Mackay, QLD)
- ❖ Pianist and composer, *Music and the Cosmos* (2007, 2009; performed at the University of Sydney and the Sydney Conservatorium of Music)
- ❖ Conductor and composer, *Music Talks Peace* (2006, 2008; performed at the University of Sydney)
- ❖ Conductor/accompanist, Australian Youth Choir Performing Arts School (2006–2007, 2010)
- ❖ Chorister and bass soloist, *John Dowland: Our Contemporary* (2010; two performances at the University of Sydney)
- ❖ Highly commended, Queensland Piano Competition (2003)
- ❖ First prize, Miriam Hyde Composer-Pianist Award (2002)
- ❖ Pi Beta Phi Award, Mackay Eisteddfod (2001)

PERSONAL

- ❖ Notable media appearances and interviews:
 - Channel 7's *Today Tonight* (aired 02/07/2007)
 - University of Sydney *UniNews* (21/09/2007, cover story)
 - *Sydney Morning Herald* (03/06/2010, p. 19)
 - Channel 10's *7PM Project* (aired 30/06/2010)
 - University of Sydney *World: USA and Canada* magazine (inaugural issue [02/2011], p. 25)
- ❖ Dual Australian-American citizen
- ❖ Black belt in martial arts (Yun Jung Do)
- ❖ Very elementary proficiency in Russian and Lithuanian
- ❖ *h*-index: 7
- ❖ Erdős-Bacon number: 8, counting television shows (me → Bill Lytton → Henry Markram → Wolfgang Maass → Noga Alon → Paul Erdős = 5; me → Andrew Rochford → Dave Hughes → Kevin Bacon = 3)

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