

CURRICULUM VITAE

A. PERSONAL DATA

1. Full name: **Oleksandr Makeyev**
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4. Place and date of birth: April 27, 1983, Kyiv, Ukraine.
5. Marital status: Married.
6. Citizenship (dual): USA (since 02/2019) and Ukraine.
7. Languages: Ukrainian, Russian, English, Spanish.
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B. EDUCATION

1. Ph.D. in Engineering Science
Clarkson University, Potsdam, NY, USA.
Date of receiving: May, 2010.
2. M.Sc. in Statistics
Taras Shevchenko National University of Kyiv, Kiev, Ukraine.
Date of receiving: June, 2005.
3. B.Sc. in Mathematics
Taras Shevchenko National University of Kyiv, Kiev, Ukraine.
Date of receiving: June, 2003.

C. PROFESSIONAL EXPERIENCE

1. Associate Professor
School of STEM, Diné College, Tsaille, AZ.
May 2019 – Present.
(Mathematics Faculty, *Mathematics/Physics/Technology Division*, August 2014 – May 2019)
2. Adjunct Assistant Professor
Department of Electrical, Computer, and Biomedical Engineering, University of Rhode Island, Kingston, RI, USA.
April 2013 – July 2014.
Research and teaching (BME461/ELE561 Physiological Modeling and Control, BME468/ELE568 Neural Engineering) in biomedical engineering.
3. Research Scientist
CREmedical Corp., Kingston, RI, USA.

February 2013 – July 2014.

Work on National Science Foundation 1248654 “SBIR Phase I: Innovative Tripolar Concentric Ring Electrode Electroencephalography (tEEG) to Advance Epilepsy Diagnosis” awarded to Dr. Walter G. Besio (principal investigator).

4. Postdoctoral Fellow

Department of Electrical, Computer, and Biomedical Engineering, University of Rhode Island, Kingston, RI, USA.

June 2010 – January 2013.

Work on National Institutes of Health R21NS061335 “Anticonvulsant effects of novel concentric ring electrode electrical stimulation” awarded to my scientific adviser Dr. Walter G. Besio (principal investigator).

5. Teaching Assistant

Department of Electrical and Computer Engineering, Clarkson University, Potsdam, NY, USA.

September 2008 – May 2010.

Teaching assistant for EE321 Systems and Signal Processing (Fall 2008, Fall 2009) and ES250 Electric Science (Spring 2009, Spring 2010). Laboratory instructor for EE321 Systems and Signal Processing (Fall 2009).

6. Research Assistant

Department of Electrical and Computer Engineering, Clarkson University, Potsdam NY, USA.

May 2006 – August 2008.

Work on National Institutes of Health R21HL083052-02 “Detection of chewing and swallowing to estimate eating patterns and energy intake” awarded to my scientific adviser Dr. Edward Sazonov (principal investigator).

D. PUBLICATIONS

1. PAPERS IN PEER-REVIEWED JOURNALS

1. **Makeyev O.**, Ye-Lin Y., Prats-Boluda G., Garcia-Casado J., Comprehensive optimization of the tripolar concentric ring electrode based on its finite dimensions model and confirmed by finite element method modeling, *Sensors*, Vol. 21, Issue 17, August 2021, Article 5881, p. 14. <https://doi.org/10.3390/s21175881>
2. Liu X., **Makeyev O.**, Besio W., Improved spatial resolution of electroencephalogram using tripolar concentric ring electrode sensors, *Journal of Sensors*, Vol. 2020, June 2020, Article 6269394, p. 9. <https://doi.org/10.1155/2020/6269394>
3. **Makeyev O.**, Musngi M., Moore L., Ye-Lin Y., Prats-Boluda G., Garcia-Casado J., Validating the comparison framework for the finite dimensions model of concentric ring electrodes using human electrocardiogram data, *Applied Sciences*, Vol. 9, Issue 20, October 2019, Article 4279, p. 14. <https://doi.org/10.3390/app9204279>
4. Garcia-Casado J., Ye-Lin Y., Prats-Boluda G., **Makeyev O.**, Evaluation of bipolar, tripolar and quadripolar Laplacian estimates of electrocardiogram via concentric ring electrodes, *Sensors*, Vol. 19, Issue 17, August 2019, Article 3780, p. 11. <https://doi.org/10.3390/s19173780>

5. **Makeyev O.**, Solving the general inter-ring distances optimization problem for concentric ring electrodes to improve Laplacian estimation, *BioMedical Engineering Online*, Vol. 17, Issue 117, August 2018, p. 21. <https://doi.org/10.1186/s12938-018-0549-6>
6. Mucio-Ramirez S., **Makeyev O.**, Safety of the transcranial focal electrical stimulation via tripolar concentric ring electrodes for hippocampal CA3 subregion neurons in rats, *Journal of Healthcare Engineering*, Vol. 2017, August 2017, Article ID 4302810, p. 7. <https://doi.org/10.1155/2017/4302810>
7. **Makeyev O.**, Besio W., Improving the accuracy of Laplacian estimation with novel variable inter-ring distances concentric ring electrodes, *Sensors*, Vol. 16, Issue 6, June 2016, Article 858, p. 16. <https://doi.org/10.3390/s16060858>
8. **Makeyev O.**, Ding Q., Besio W.G., Improving the accuracy of Laplacian estimation with novel multipolar concentric ring electrodes, *Measurement*, Vol. 80, February 2016, pp. 44-52. <https://doi.org/10.1016/j.measurement.2015.11.017>
9. Sadowska G.B., Chen X., Zhang J., Lim Y.P., Cummings E., **Makeyev O.**, Besio W.G., Gaitanis J., Padbury J., Banks W.A., Stonestreet B.S., Interleukin-1 β transfer across the blood-brain barrier in the ovine fetus, *Journal of Cerebral Blood Flow & Metabolism*, Vol. 35, Issue 9, September 2015, pp. 1388-1395.
10. Zhang J., Sadowska G.B., Chen X., Park S.Y., Kim J.E., Bodge C.A., Cummings E., Lim Y.P., **Makeyev O.**, Besio W.G., Gaitanis J., Banks W.A., Stonestreet B.S., Anti-IL-6 neutralizing antibody modulates blood-brain barrier function in the ovine fetus, *FASEB Journal*, Vol. 29, Issue 5, May 2015, pp. 1739-1753.
11. Chen X., Sadowska G.B., Zhang J., Kim J.E., Cummings E.E., Bodge C., Lim Y.P., **Makeyev O.**, Besio W.G., Gaitanis J., Threlkeld S.W., Stonestreet B.S., Neutralizing anti-interleukin-1 β antibodies modulate fetal blood-brain barrier function after ischemia, *Neurobiology of Disease*, Vol. 73, January 2015, pp. 118-129.
12. Besio W.G., Martínez-Juárez I.E., **Makeyev O.**, Gaitanis J.N., Blum A.S., Fisher R.S., Medvedev A.V., High-frequency oscillations recorded on the scalp of patients with epilepsy using tripolar concentric ring electrodes, *IEEE Journal of Translational Engineering in Health and Medicine*, Vol. 2, Article 2000111, June 2014, p. 11.
13. Besio W., **Makeyev O.**, Medvedev A., Gale K., Effects of transcranial focal stimulation via tripolar concentric ring electrodes on pentylentetrazole-induced seizures in rats, *Epilepsy Research*, Vol. 105, Issues 1-2, July 2013, pp. 42-51.
14. **Makeyev O.**, Luna-Munguía H., Rogel-Salazar G., Liu X., Besio W., Noninvasive transcranial focal stimulation via tripolar concentric ring electrodes lessens behavioral seizure activity of recurrent pentylentetrazole administrations in rats, *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, Vol. 21, Issue 3, May 2013, pp. 383-390. <https://doi.org/10.1109/TNSRE.2012.2198244>
15. Chen X., Threlkeld S.W., Cummings E.E., Juan I., **Makeyev O.**, Besio W.G., Gaitanis J., Banks W.A., Sadowska G.B., Stonestreet B.S., Ischemia-reperfusion increases blood-brain barrier permeability and alters tight junction protein expression in ovine fetuses, *Neuroscience*, Vol. 226, December 2012, pp. 89-100.
16. **Makeyev O.**, Lopez-Meyer P., Schuckers S., Besio W., Sazonov E., Automatic food intake detection based on swallowing sounds, *Biomedical Signal Processing and Control*, Vol. 7, Issue 6, November 2012, pp. 649-656.
17. Lopez-Meyer P., Schuckers S., **Makeyev O.**, Fontana J., Sazonov E., Automatic identification of the number of food items in a meal using clustering techniques based on the monitoring of swallowing and chewing, *Biomedical Signal Processing and Control*, Vol. 7, Issue 5, September 2012, pp. 474-480.

18. **Makeyev O.**, Liu X., Luna-Munguía H., Rogel-Salazar G., Mucio-Ramirez S., Liu Y., Sun Y., Kay S., Besio W., Toward a noninvasive automatic seizure control system in rats with transcranial focal stimulations via tripolar concentric ring electrodes, *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, Vol. 20, Issue 4, July 2012, pp. 422-431. <https://doi.org/10.1109/TNSRE.2012.2197865>
19. Kussul E., **Makeyev O.**, Baidyk T., Saniger Blesa J., Bruce N., Lara-Rosano F., The problem of automation of solar concentrator assembly and adjustment, *International Journal of Advanced Robotic Systems*, Vol. 8, Issue 4, September 2011, pp. 150-157.
20. Martín-González A., Baidyk T., Kussul E., **Makeyev O.**, Improved neural classifier for microscrew shape recognition, *Optical Memory and Neural Networks (Information Optics)*, Vol. 19, Issue 3, September 2010, pp. 220-226.
21. Lopez-Meyer P., **Makeyev O.**, Schuckers S., Melanson E., Neuman M., Sazonov E., Detection of food intake from swallowing sequences by supervised and unsupervised methods, *Annals of Biomedical Engineering*, Vol. 38, Issue 8, August 2010, pp. 2766-2774.
22. **Makeyev O.**, Sazonov E., Moklyachuk M., Lopez-Meyer P., Hybrid genetic algorithm for microscrew thread parameter estimation, *Engineering Applications of Artificial Intelligence*, Vol. 23, Issue 4, June 2010, pp. 446-452.
23. Sazonov E., **Makeyev O.**, Schuckers S., Lopez-Meyer P., Melanson E., Neuman M., Automatic detection of swallowing events by acoustical means for applications of monitoring of ingestive behavior, *IEEE Transactions on Biomedical Engineering*, Vol. 57, Issue 3, March 2010, pp. 626–633.
24. Sazonov E., Schuckers S., Lopez-Meyer P., **Makeyev O.**, Melanson E., Neuman M., Hill J., Toward objective monitoring of ingestive behavior in free living population, *Obesity*, Vol. 17, Issue 10, October 2009, pp. 1971–1975.
25. Baidyk T., Kussul E., **Makeyev O.**, Pattern recognition for micro workpieces manufacturing, *Computación y Sistemas (Ibero-American Journal of Computing)*, Vol. 13, Issue 1, September 2009, pp. 61-74.
26. Sazonov E., Schuckers S., Lopez-Meyer P., **Makeyev O.**, Sazonova N., Melanson E., Neuman M., Reply to 'Comment on "Non-invasive monitoring of chewing and swallowing for objective quantification of ingestive behavior"', *Physiological Measurement*, Issue 5, Vol. 30, May 2009, pp. L5-L7.
27. Baidyk T., Kussul E., **Makeyev O.**, Vega A., Limited receptive area neural classifier based image recognition in micromechanics and agriculture, *International Journal of Applied Mathematics and Informatics*, Issue 1, Vol. 2, 2008, pp. 96-103.
28. Kussul E., Baidyk T., **Makeyev O.**, Lara-Rosano F., Saniger J.M., Bruce N., Flat facet parabolic solar concentrator with support cell for one and more mirrors, *WSEAS Transactions on Power Systems*, Issue 8, Vol. 3, August 2008, pp. 577-586.
29. Sazonov E., Schuckers S., Lopez-Meyer P., **Makeyev O.**, Sazonova N., Melanson E., Neuman M., Non-invasive monitoring of chewing and swallowing for objective quantification of ingestive behavior, *Physiological Measurement*, Issue 5, Vol. 29, May 2008, pp. 525-541.
30. **Makeyev O.**, Sazonov E., Baidyk T., Martín A., Limited receptive area neural classifier for texture recognition of mechanically treated metal surfaces, *Neurocomputing*, Issue 7-9, Vol. 71, March 2008, pp. 1413-1421.
31. Kussul E., Baidyk T., **Makeyev O.**, Lara-Rosano F., Saniger J.M., Bruce N., Development of micro mirror solar concentrator, *WSEAS Transactions on Power Systems*, Issue 8, Vol. 2, August 2007, pp. 188-194.

32. Kussul E., Baidyk T., Wunsch D., **Makeyev O.**, Martín A., Permutation coding technique for image recognition systems, *IEEE Transactions on Neural Networks*, Vol. 17/6, November 2006, pp. 1566-1579.
33. Baidyk T., Kussul E., **Makeyev O.**, Texture recognition with random subspace neural classifier, *WSEAS Transactions on Circuits and Systems*, Issue 4, Vol. 4, April 2005, pp. 319-325.
34. **Makeyev O.**, Evolutionary algorithm for measurement of screw parameters, *WSEAS Transactions on Systems*, Issue 2, Vol. 3, April 2004, pp. 861-865.
35. Baidyk T., Kussul E., **Makeyev O.**, Caballero A., Ruiz L., Carrera G., Velasco G, Flat image recognition in the process of microdevice assembly, *Pattern Recognition Letters*, Vol. 25/1, 2004, pp. 107-118.

2. BOOK CHAPTERS

1. Baidyk T., **Makeyev O.**, Kussul E., Rodríguez Flores M.A., Limited Receptive Area Neural Classifier for Larvae Recognition, In: *Pesticides - Advances in Chemical and Botanical Pesticides*, Ed. by R.P. Soundararajan, InTech, ISBN: 978-953-51-0680-7, 2012, pp. 309-326.
2. Kussul E., **Makeyev O.**, Baidyk T., Martín-Gonzalez A., Toledo-Ramirez G., Some applications of computer vision systems in micromechanics, In: *Computer Vision*, Ed. by Sota R. Yoshida, Nova Science Publishers, 2011, pp. 1-40.
3. Baidyk T., Kussul E., **Makeyev O.**, General purpose image recognition systems based on neural classifiers, In: *Progress in Neurocomputing Research*, Ed. by Gerald B. Kang, Nova Science Publishers, 2008, pp. 83-114.
4. **Makeyev O.**, Baidyk T., Martín A., Limited receptive area neural classifier for texture recognition of metal surfaces, In: *IFIP International Federation for Information Processing*, Vol. 217, *Artificial Intelligence in Theory and Practice*, Ed. by Max Bramer, Springer, 2006, pp. 375-384.
5. Kussul E., Baidyk T., Lara-Rosano F., **Makeyev O.**, Martín A., Wunsch D., Micromechanics as a testbed for artificial intelligence methods evaluation, In: *IFIP International Federation for Information Processing*, Vol. 218, *Professional Practice in Artificial Intelligence*, Ed. by John Debenham, Springer, 2006, pp. 275-284.
6. Kussul E., Baidyk T., Ruiz-Huerta L., Caballero-Ruiz A., Velasco G., **Makeyev O.**, Techniques in the development of micromachine tool prototypes and their applications in microfactories, In: *MEMS/NEMS Handbook: Techniques and Applications*, Ed. by Cornelius T. Leondes, Vol. 3, Springer, 2006, pp. 1-61.

3. PROCEEDINGS OF THE PEER-REVIEWED CONFERENCES

1. **Makeyev O.**, Lee A., Begay A., Solving the inter-ring distances optimization problem for pentapolar and sextopolar concentric ring electrodes based on the negligible dimensions model of the electrode, 8th International Electronic Conference on Sensors and Application, November 1-15, 2021. <https://doi.org/10.3390/ecsa-8-11280>
2. **Makeyev O.**, Ye-Lin Y., Prats-Boluda G., Garcia-Casado J., Finite element method modeling to confirm the results of comprehensive optimization of the tripolar concentric ring electrode based on its finite dimensions model, 43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, November 1-5, 2021, pp. 7244-7247. <https://doi.org/10.1109/EMBC46164.2021.9629784>
3. **Makeyev O.**, Comprehensive optimization of the tripolar concentric ring electrode with respect to the accuracy of Laplacian estimation based on the finite dimensions model of the electrode, 7th International Electronic Conference on Sensors and Applications, November 15-30, 2020. <https://doi.org/10.3390/ecsa-7-08167>

4. **Makeyev O.**, Lee F., Musngi M., Feasibility of automatic detection of high-frequency oscillations in human tripolar Laplacian electroencephalogram using exponentially embedded family, 6th International Electronic Conference on Sensors and Applications, November 15-30, 2019.
5. **Makeyev O.**, Musngi M., Lee F., Tamayo M., Recent advances in high-frequency oscillations and seizure onset detection using Laplacian electroencephalography via tripolar concentric ring electrodes, 4th International Electronic Conference on Sensors and Applications, November 15-30, 2017.
6. **Makeyev O.**, Joe C., Lee C., Besio W., Analysis of variance to assess statistical significance of Laplacian estimation accuracy improvement due to novel variable inter-ring distances concentric ring electrodes, 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Jeju Island, Korea, July 11-15, 2017, pp. 4110-4113.
7. **Makeyev O.**, Lee C., Besio W., Proof of concept Laplacian estimate derived for noninvasive tripolar concentric ring electrode with incorporated radius of the central disc and the widths of the concentric rings, 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Jeju Island, Korea, July 11-15, 2017, pp. 841-844.
8. **Makeyev O.**, Besio W., Analytic assessment of Laplacian estimates via novel variable inter-ring distances concentric ring electrodes, 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, FL, August 16-20, 2016, pp. 2058-2062.
9. **Makeyev O.**, Besio W., Finite element method modeling to assess Laplacian estimates via novel variable inter-ring distances concentric ring electrodes, 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, FL, August 16-20, 2016, pp. 2054-2057.
10. Zhu Z., Brooks J., **Makeyev O.**, Kay S.M., Besio W.G., Equivalency between emulated disc electrodes and conventional disc electrode human electroencephalography, 36th Annual International Conference of the IEEE EMBS, Chicago, IL, August 26-30, 2014, pp. 5248-5251.
11. Luby M.D., **Makeyev O.**, Besio W.G., Chronic transcranial focal stimulation from tripolar concentric ring electrodes does not disrupt memory formation in rats, 36th Annual International Conference of the IEEE EMBS, Chicago, IL, August 26-30, 2014, pp. 6139-6142.
12. **Makeyev O.**, Lennon T., Boudria Y., Zhu Z., Besio W., Frequency domain synchrony between signals from the conventional disc electrode and the outer ring of the tripolar concentric ring electrode in human electroencephalogram data, 40th Annual Northeast Bioengineering Conference, Boston, MA, April 25-27, 2014, p. 2.
13. **Makeyev O.**, Boudria Y., Zhu Z., Lennon T., Besio W., Emulating conventional disc electrode with the outer ring of the tripolar concentric ring electrode in phantom and human electroencephalogram data, IEEE Signal Processing in Medicine and Biology Symposium, New York City, December 7, 2013, pp. 1-4.
14. **Makeyev O.**, Ding Q., Kay S., Besio W.G., Toward improving the Laplacian estimation with novel multipolar concentric ring electrodes, 35th Annual International Conference of the IEEE EMBS, Osaka, Japan, July 3-7, 2013, pp. 1486-1489.
15. **Makeyev O.**, Ding Q., Martínez-Juárez I.E., Gaitanis J., Kay S., Besio W.G., Multiple sensor integration for seizure onset detection in human patients comparing conventional disc versus novel tripolar concentric ring electrodes, 35th Annual International Conference of the IEEE EMBS, Osaka, Japan, July 3-7, 2013, pp. 17-20.
16. **Makeyev O.**, Ding Q., Kay S., Besio W.G., Sensor integration of multiple tripolar concentric ring electrodes improves pentylenetetrazole-induced seizure onset detection in rats, 34th Annual

- International Conference of the IEEE EMBS, San Diego, USA, August 28 - September 1, 2012, pp. 5154-5157.
17. **Makeyev O.**, Liu X., Wang L., Zhu Z., Taveras A., Troiano D., Medvedev A., Besio W.G., Feasibility of recording high frequency oscillations with tripolar concentric ring electrodes during pentylenetetrazole-induced seizures in rats, 34th Annual International Conference of the IEEE EMBS, San Diego, USA, August 28 - September 1, 2012, pp. 4599-4602.
 18. Kussul E., **Makeyev O.**, Baidyk T., Olvera O., Ericsson heat engine for small solar power plants, International Conference on "Low cost electricity generating heat engines for rural areas", Nottingham, UK, April 2-3, 2012, pp. 1-10.
 19. Kussul E., **Makeyev O.**, Baidyk T., Saniger Blesa J., Bruce N., Lara-Rosano F., Support frame assembly and adjustment for solar concentrator, International Conference on Innovative Technologies IN-TECH 2011, Bratislava, Slovakia, September 1-3, 2011, pp. 314-316.
 20. **Makeyev O.**, Liu X., Koka K., Kay S.M., Besio W.G., Transcranial focal stimulation via concentric ring electrodes reduced power of pentylenetetrazole-induced seizure activity in rat electroencephalogram, 33rd Annual International IEEE EMBS Conference, Boston, USA, August 30 - September 3, 2011, pp. 7560-7563.
 21. Besio W.G., Hadidi R., **Makeyev O.**, Luna-Munguía H., Rocha L., Electric fields in hippocampus due to transcranial focal electrical stimulation via concentric ring electrodes, 33rd Annual International IEEE EMBS Conference, Boston, USA, August 30 - September 3, 2011, pp. 5488-5491.
 22. Liu X., **Makeyev O.**, Besio W.G., A comparison of tripolar concentric ring electrode and spline Laplacians on a four-layer concentric spherical model, 33rd Annual International IEEE EMBS Conference, Boston, USA, August 30 - September 3, 2011, pp. 2949-2952.
 23. Lopez-Meyer P., Schuckers S., **Makeyev O.**, Sazonov E., Detection of periods of food intake using support vector machines, 32nd Annual International IEEE EMBS Conference, Buenos Aires, Argentina, August 31 - September 4, 2010, pp. 1004-1007.
 24. Kussul E., **Makeyev O.**, Baidyk T., Calderon-Reyes D., Neural network with ensembles, International Joint Conference on Neural Networks IJCNN 2010, Barcelona, Spain, July 18-23, 2010, pp. 2955-2961.
 25. Baidyk T., Kussul E., **Makeyev O.**, Vega A., Image recognition with neural classifiers in micromechanics and agriculture, 10th WSEAS International Conference on Neural Networks NN'09, Prague, Czech Republic, March 23-25, 2009, pp.100-103.
 26. **Makeyev O.**, Sazonov E., Schuckers S., Lopez-Meyer P., Baidyk T., Melanson E., Neuman M., Recognition of swallowing sounds using time-frequency decomposition and limited receptive area neural classifier, Applications and Innovations in Intelligent Systems XVI: Proceedings of AI-2008, The Twenty-eighth SGA International Conference on Innovative Techniques and Applications of Artificial Intelligence, Eds. Tony Allen, Richard Ellis and Miltos Petridis, Springer, ISBN: 978-1-84882-214-6, Cambridge, UK, December 9-11, 2008, pp. 33-46.
 27. Baidyk T., Kussul E., **Makeyev O.**, Computer vision systems for manufacturing of micro workpieces, Applications and Innovations in Intelligent Systems XVI: Proceedings of AI-2008, The Twenty-eighth SGA International Conference on Innovative Techniques and Applications of Artificial Intelligence, Eds. Tony Allen, Richard Ellis and Miltos Petridis, Springer, ISBN: 978-1-84882-214-6, Cambridge, UK, December 9-11, 2008, pp. 19-32.
 28. Kussul E., Baidyk T., **Makeyev O.**, Lara-Rosano F., Saniger J.M., Bruce N., Flat facet parabolic solar concentrator, 2nd WSEAS/IASME International Conference on Renewable Energy Sources (RES-08)-2008, Corfu, Greece, October 26-28, 2008, pp. 46-51.
 29. **Makeyev O.**, Sazonov E., Schuckers S., Lopez-Meyer P., Melanson E., Neuman M., Limited receptive area neural classifier for recognition of swallowing sounds using continuous wavelet

- transform, 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society EMBC 2007, Lyon, France, August 23-26, 2007, pp. 3128-3131.
30. Sazonov E., Krishnamurthy V., **Makeyev O.**, Browning R., Hill J., Schutz Y., Automatic recognition of postural allocations, 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society EMBC 2007, Lyon, France, August 23-26, 2007, pp. 4993-4996.
 31. **Makeyev O.**, Sazonov E., Schuckers S., Melanson E., Neuman M., Limited receptive area neural classifier for recognition of swallowing sounds using short-time Fourier transform, International Joint Conference on Neural Networks IJCNN 2007, Orlando, USA, August 12-17, 2007, pp. 1601-1606.
 32. Kussul E., Baidyk T., **Makeyev O.**, Pairwise Permutation Coding Neural Classifier, International Joint Conference on Neural Networks IJCNN 2007, Orlando, USA, August 12-17, 2007, pp. 1847-1852.
 33. Kussul E., Baidyk T., **Makeyev O.**, Lara-Rosano F., Saniger J.M., Bruce N., Development of micro mirror solar concentrator, 2nd IASME/WSEAS Int. Conf. on Energy & Environment EE 2007, Portoroz, Slovenia, May 15-17, 2007, pp. 293-298.
 34. Kussul E., Baidyk T., Wunsch D., **Makeyev O.**, Martin A., Image recognition systems based on random local descriptors, International Joint Conference on Neural Networks IJCNN 2006, Vancouver, Canada, July 16-21, 2006, pp. 4722-4727.
 35. Baidyk T., Kussul E., **Makeyev O.**, Martín A., Reconocimiento de texturas de superficies metálicas, Congreso de Instrumentación SOMI XX, Leon, Guanajuato, México, October 23-28, 2005, p.8 (in Spanish).
 36. Baidyk T., Kussul E., **Makeyev O.** Texture recognition with random subspace neural classifier, WSEAS International Conference on Systems Science and Engineering, ICOSSE2005, Rio de Janeiro, Brazil, April 25-27, 2005, #494-258, p. 6.
 37. **Makeyev O.**, Evolutionary algorithm for measurement of screw parameters, WSEAS/IASME International Conference on Evolutionary Computation EC'04, Udine, Italy, March 25-27, 2004, #483-231, p. 5.
 38. Baidyk T., Kussul E., **Makeyev O.**, Image recognition system for microdevice assembly, Twenty-First IASTED International Multi-Conference on Applied Informatics - AI2003, Innsbruck, Austria, February 10-13, 2003, pp. 243-248.
 39. **Makeyev O.**, Neural interpolator for image recognition in the process of microdevice assembly, International Joint Conference on Neural Networks IJCNN 2003, Vol. 3, Portland, Oregon, USA, July 20-24, 2003, pp. 2222-2226.

4. ABSTRACTS AND POSTERS

1. **Makeyev O.**, Recent progress on design optimization of concentric ring electrodes based on negligible and finite dimensions models, NSF Tribal Colleges & Universities Program Virtual Research Symposium, February 23, 2022.
2. **Makeyev O.**, Lee A., Begay A., Toward solving the inter-ring distances optimization problem for pentapolar, sextopolar, and septapolar concentric ring electrodes based on the negligible dimensions model of the electrode, 6th National Science Foundation Tribal Colleges and Universities Program Research Symposium (TRS19), Alexandria, VA, December 17-18, 2019.
3. Sorrell R., Musngi M., Lee F., **Makeyev O.**, Creating outreach and collaborative spaces in the library: STEM research lab at DC library, Tribal College Librarians Institute (TCLI), Bozeman, MT, June 4-8, 2018.
4. **Makeyev O.**, Optimizing the design of noninvasive concentric ring electrodes for electrophysiological measurement, 5th National Science Foundation Tribal Colleges and

- Universities Program Research Symposium (TRS18), Alexandria, VA, May 23-24, 2018, p. 36 (printed proceedings).
5. Lee F., Musngi M., **Makeyev O.**, Exponentially embedded family to detect high-frequency oscillations in human tripolar Laplacian EEG, Emerging Researchers National (ERN) Conference in Science, Technology, Engineering and Mathematics (STEM), Washington DC, February 22-24, 2018, Abstr. 366, Online.
 6. Lee C., **Makeyev O.**, Besio W., Incorporating the diameter of the central disc and the widths of the concentric rings into the $(4n + 1)$ -point method of Laplacian estimation for noninvasive concentric ring electrodes, 2016 SACNAS National Diversity in STEM Conference, Long Beach, CA, October 13-15, 2016.
 7. Harvey W., **Makeyev O.**, Ding Q., Besio W.G., Deriving analytic Laplacian estimates for multipolar concentric ring electrodes using inverse Vandermonde matrix, 2015 SACNAS National Conference, Washington DC, October 29-31, 2015, Abstr. FRI-817, Online
 8. **Makeyev O.**, Ding Q., Kay S., Besio W.G., Finite element method modeling to assess and compare Laplacian estimates via novel multipolar concentric ring electrodes, Society for Industrial and Applied Mathematics Workshop on Network Science (SIAM NS15), Snowbird, UT, USA, May 16-17, 2015.
 9. Abtahi M., Martínez-Juárez I.E., **Makeyev O.**, Medvedev A., Gaitanis J., Fisher R., Besio W., Automated high-frequency oscillation detection from tripolar concentric ring electrode scalp recordings, 68th Annual Meeting of the American Epilepsy Society, Seattle, WA, USA, December 5-9, 2014, Abstr. 3.073, *Epilepsy Currents*, Vol. 15, Issue s1, January/February 2015, p. 422.
 10. Mucio-Ramirez S., **Makeyev O.**, Besio W., Morphological evaluation of the CA3 hippocampal neurons after transcranial focal electrical stimulation, Neuroscience 2014: Society for Neuroscience 44th Annual Meeting, Washington, DC, USA, November 15-19, 2014, Program/Poster: R7/325.8, Online.
 11. Mucio-Ramirez S., Besio W., **Makeyev O.**, Evaluación morfológica del efecto de la estimulación eléctrica focal transcutánea no invasiva en la subregión CA3 del hipocampo, XXVIII Reunión Anual de Investigación del Instituto Nacional de Psiquiatría Ramón de La Fuente Muñiz, Mexico City, Mexico, October 2-4, 2013 (in Spanish).
 12. Besio W., **Makeyev O.**, Liu X., Possible effect of low current transcranial focal stimulation via tripolar concentric ring electrodes on behavioral seizure activity induced by pentylentetrazole in rats, 66th Annual Meeting of the American Epilepsy Society, San Diego, CA, USA, November 30 - December 4, 2012, Abst. 3.063, *Epilepsy Currents*, Vol. 13, Issue s1, January/February 2013, pp. 353-354.
 13. Medvedev A.V., Martínez-Juárez I.E., **Makeyev O.**, Fernández-González-Aragón M., Moreno-Avellan Á.J., Besio W.G., Gamma-band Pre-seizure activity detected with tripolar concentric ring electrode Laplacian electroencephalography from scalp, 66th Annual Meeting of the American Epilepsy Society, San Diego, CA, USA, November 30 - December 4, 2012, Abst. 1.047, *Epilepsy Currents*, Vol. 12, Issue s3, January/February 2013, pp. 21-22.
 14. Liu X., **Makeyev O.**, Besio W.G., A spatial resolution study comparing the half sensitivity volume between the tripolar concentric ring electrode and the conventional disc electrode, Neuroscience 2012: Society for Neuroscience 42nd Annual Meeting, New Orleans, LA, USA, October 13-17, 2012, Program/Poster: 712.27/GGG3, Online.
 15. Britton D., **Makeyev O.**, Luna-Munguía H., Besio W.G., Simulation based verification of In vivo electric fields in hippocampus due to transcranial focal stimulation via tripolar concentric ring electrodes, Neuroscience 2012: Society for Neuroscience 42nd Annual Meeting, New Orleans, LA, USA, October 13-17, 2012, Program/Poster: 424.05, Online.

16. **Makeyev O.**, Liu X., Luna-Munguía H., Rogel-Salazar G., Mucio-Ramirez S., Liu Y., Sun Y., Hadidi R., Kay S., Besio W., Toward an automatic seizure control system in rats through transcranial focal stimulation via tripolar concentric ring electrodes, 65th Annual Meeting of the American Epilepsy Society, Baltimore, MD, USA, December 2-6, 2011, Abst. 1.070, *Epilepsy Currents*, Vol. 12, Issue s1, January/February 2012, pp. 29-30.
17. Mucio-Ramirez S., **Makeyev O.**, Liu X., Leon-Olea M., Besio W., Cortical integrity after transcutaneous focal electrical stimulation via concentric ring electrodes, Neuroscience 2011: Society for Neuroscience Annual Meeting, Washington DC, USA, November 12-16, 2011, Program/Poster: 672.20/Y19, Online.
18. Mucio-Ramirez S., **Makeyev O.**, Liu X., Leon-Olea M., Besio W., Integridad cortical después de la estimulación eléctrica focal transcutánea no invasiva vía electrodos de anillos concéntricos, XXVI Reunión Anual de Investigación del Instituto Nacional de Psiquiatría Ramón de La Fuente Muñiz, Mexico City, Mexico, October 12-14, 2011 (in Spanish).
19. **Makeyev O.**, Besio W., Tripolar concentric ring electrode electroencephalogram, Life Sciences Technology Showcase, Providence, RI, USA, October 12, 2011.
20. Besio W., Kay S., Liu X., **Makeyev O.**, Optimization of spatial filtering sensor for biomedical applications, 9th IEEE Conference on Sensors Open Poster, Waikoloa, Hawaii, USA, November 1-4, 2010.
21. Sazonov E., Lopez-Meyer P, Schuckers S., **Makeyev O.**, Melanson E., Neuman M., Objective prediction of ingested food mass using support vector regression, The Obesity Society's 2009 Annual Scientific Meeting, Washington DC, USA, October 24-28, 2009.
22. Sazonov E., Schuckers S., Lopez-Meyer P, **Makeyev O.**, Sazonova N., Melanson E., Neuman M., Non-invasive monitoring of chewing and swallowing for objective determination of periods of food intake, Clarkson University Annual Biomedical Engineering, Science, and Technology (BEST) Conference, Potsdam, NY, USA, April 23, 2008.

5. PAPERS IN REVIEW

1. **Makeyev O.**, Ye-Lin Y., Prats-Boluda G., Garcia-Casado J., Comparing optimal and commercially available bipolar and tripolar concentric ring electrode configurations using finite element method modeling based on their finite dimensions models, IEEE Sensors Applications Symposium, Sundsvall, Sweden, August 1-3, 2022 (in review).

E. RESEARCH GRANTS

Funding level stated as: \$ total (% my part)

1. 6/1/2022 – 5/31/2024, NSF HRD SGR award 2212707, *Validating the optimal design of concentric ring electrodes on phantom data*, PI, \$200,000 (100%).
2. 9/1/2019 – 8/31/2022, NSF HRD SGR award 1914787, *Optimizing concentric ring electrode design for noninvasive electrophysiological measurement*, PI, \$200,002 (100%).
3. 9/15/2016 – 8/31/2020, NSF HRD SGR award 1622481, *Seizure onset detection using tripolar Laplacian electroencephalography*, PI, \$200,000 (100%).
4. 9/2015 – 9/2016, Arizona/NASA Space Grant award 175-B5E7, *Optimization of novel multipolar concentric ring electrodes*, PI, \$5,000 (100%).
5. 9/15/2015 – 8/31/2020, NSF HRD award 1461519, *Stem 2020-Dine College*, Program Lead for A.S. in Pre-engineering and B.S. in Secondary Education, Mathematics, \$2,498,496 (N/A).

F. PATENTS AND APPLICATIONS

1. U.S. continuation patent application number 17/353095 Concentric ring electrodes for improved accuracy of Laplacian estimation; sole inventor; filed: June 21, 2021 (Pending).
2. U.S. patent number 11,045,132 Concentric ring electrodes for improved accuracy of Laplacian estimation; sole inventor; filed: October 9, 2020; issued: June 29, 2021.
3. U.S. patent application number 16/417,422 Determination of optimal Laplacian estimates and optimal inter-ring distances for concentric ring electrodes; sole inventor; filed: May 20, 2019 (Pending).

G. TEACHING

1. Diné College, Tsaile, AZ
MTH096 Basic Mathematics: Fall 2014, Spring 2015, Fall 2015
MTH100 Intermediate Algebra: Fall 2014, Spring 2015, Fall 2015
MTH110 College Algebra: Fall 2014, Spring 2015, Fall 2015, Spring 2016, Fall 2016, Spring 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2020, Fall 2020, Spring 2021
MTH114 College Mathematics: Fall 2014
MTH213 Statistics: Spring 2015, Fall 2015, Spring 2016, Fall 2016, Spring 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2020, Fall 2020, Spring 2021
2. University of Rhode Island, Kingston, RI
BME468/ELE568 Neural Engineering: Spring 2014
BME461/ELE561 Physiological Modeling and Control: Fall 2010, 2011, 2012, 2013 (secondary instructor; primary instructor in Fall 2013)
3. Clarkson University, Potsdam, NY
ES250 Electric Science: Spring 2009, 2010 (teaching assistant).
EE321 Systems and Signal Processing: Fall 2008, 2009 (teaching assistant; laboratory instructor in Fall 2009)

H. PERSONAL ACTIVITIES

1. Technical Program Committee, Thirteenth International Conference on Sensor Device Technologies and Applications SENSORDEVICES 2022, October 16-20, 2022, Lisbon, Portugal.
2. Reviewer, Measurement (Elsevier).
3. Reviewer, Brain Sciences (MDPI).
4. Technical Program Committee, Twelfth International Conference on Sensor Device Technologies and Applications SENSORDEVICES 2021, November 14-18, 2021, Athens, Greece.

5. Technical Program Committee, Eleventh International Conference on Sensor Device Technologies and Applications SENSORDEVICES 2020, November 21-25, 2020, Valencia, Spain.
6. Technical Program Committee, Tenth International Conference on Sensor Device Technologies and Applications SENSORDEVICES 2019, October 27-31, 2019, Nice, France.
7. Reviewer, Sustainability (MDPI).
8. Reviewer, Micromachines (MDPI).
9. Reviewer, Applied Sciences (MDPI).
10. Technical Program Committee, Ninth International Conference on Sensor Device Technologies and Applications SENSORDEVICES 2018, September 16-20, 2018, Venice, Italy.
11. Reviewer, SENSORDEVICES - International Conference on Sensor Device Technologies and Applications (IARIA).
12. Reviewer, BioMedical Engineering OnLine (Springer).
13. Reviewer, National Science Foundation, Tribal Colleges and Universities Program: research funding proposals.
14. Reviewer, Diné College Institutional Review Board: research funding proposals.
15. Reviewer, Swiss National Science Foundation: research funding proposals.
16. Reviewer, Brain Research (Elsevier).
17. Reviewer, Sensors (MDPI).
18. Reviewer, Biomedical Signal Processing and Control (Elsevier).
19. Reviewer, Medical & Biological Engineering & Computing (Springer).
20. Reviewer, International Conference on Biomedical and Health Informatics (IEEE).
21. Reviewer, International IEEE EMBS Conference on Neural Engineering (IEEE).
22. Reviewer, IEEE Sensors Journal (IEEE).
23. Reviewer, Annual International Conference of the IEEE Engineering in Medicine and Biology Society (IEEE EMBS): contributed papers and Student Paper Competition finalists.
24. Reviewer, IEEE Symposium Series on Computational Intelligence (IEEE).
25. Reviewer, IEEE Transactions on Biomedical Engineering (IEEE).
26. Reviewer, Pattern Recognition Letters (Elsevier).
27. Reviewer, International Journal of Computer Assisted Radiology and Surgery (Springer).
28. Reviewer, International Joint Conference on Neural Networks (IEEE CIS, INNS).
29. Reviewer, Neural Networks (Elsevier).

I. SERVICE

1. Diné College Institutional Review Board (member; Fall 2017 – present).
2. Research Mentor for Diné College Summer Intern Program (Summer 2016; 2 students).
3. Diné College Leadership Council (member; Spring 2015 – Spring 2016).
4. Diné College Distance Education Committee (member; Fall 2014 – Spring 2017).
5. Arizona Engineering Articulation Task Force (permanent representative for Diné College; Fall 2014 – Present).

J. INVITED TALKS (EXCLUDING PAPER PRESENTATIONS)

1. "Biomedical Engineering Research", Summer Intern Program, Diné College, Tsaile, AZ, June 10, 2016.
2. "Toward a Noninvasive Automatic Seizure Control System with Transcranial Focal Stimulation via Tripolar Concentric Ring Electrodes", Department of Electrical, Computer and Biomedical Engineering, University of Rhode Island, Kingston, RI, April 4, 2012.
3. "Automatic Detection of Swallowing for Monitoring of Ingestive Behavior", Department of Electrical, Computer and Biomedical Engineering, University of Rhode Island, Kingston, RI, October 6, 2010.

K. STUDENT ADVISEES: AWARDS AND EXTERNAL FUNDING

1. Frederick Lee (B.A. in Business Administration, class of 2019) and Mark Musngi (B.S. in Secondary Education, Science, class of 2019), 3rd place at the Sixth Annual Navajo Technical University Research Day competition, March 1, 2018, Crownpoint, NM.
2. Frederick Lee (B.A. in Business Administration, class of 2019), travel award to present at the Emerging Researchers National (ERN) Conference in Science, Technology, Engineering and Mathematics (STEM), February 22-24, 2018, Washington, D.C.
3. Colin Lee (A.S. in Mathematics, class of 2017), travel award to present at the 2016 SACNAS National Diversity in STEM Conference, Long Beach, CA, October 13-15, 2016.
4. Thomas Lennon, Emulating conventional disc electrode with the use of tripolar concentric ring electrode, Undergraduate Research Initiative Grant from the University of Rhode Island, \$1000, Spring 2014 - Spring 2015, co-sponsored with Dr. W.G. Besio.

L. MEDIA

1. June 3, 2022 – "Diné College Professor's Funding Proposal Receives an Award From the National Science Foundation," News Release, Diné College: <https://www.dinecollege.edu/news-release-dine-college-professor-receives-award-from-national-science-foundation/>
2. July 12, 2021 – "U. S. Patent and Trademark Office Issues a Patent to Diné College," News Release, Diné College: <https://www.dinecollege.edu/news-release-u-s-patent-and-trademark-office-issues-a-patent-to-dine-college/>
 - a. July 14, 2021 – "Diné College Professor Receives Patent for Medical Diagnostic Technology" by Marcella Nez, *Tribal College Journal*: <https://tribalcollegejournal.org/dine-college-professor-receives-patent-for-medical-diagnostic-technology/>
 - b. July 15, 2021 – "Diné College professor receives patent for diagnostic tool," *Navajo Times* education briefs: <https://navajotimes.com/edu/education-briefs-dine-college-joins-global-fight-against-bacteria/#:%7E:text=Din%C3%A9%20College%20professor%20receives%20patent%20for%20diagnostic%20tool>
 - c. July 22, 2021 – "Diné College Professor Receives Patent" by Paul Boyer, *Native Science Report*: <https://nativesciencereport.org/2021/07/dine-college-professor-receives-patent/>
3. November 2020 – "Small Grants, Big Impact: The National Science Foundation's Small Grants for Research program promotes faculty recruitment and retention within tribal

colleges, while also strengthening undergraduate teaching” by Melanie Lenart, *Native Science Report*: <https://nativesciencereport.org/2020/11/small-grants-big-impact/>

4. October 31, 2018 – “Diné College Prof Researching Root of Epilepsy,” News Release, Diné College: <https://www.dinecollege.edu/news-release-dine-college-prof-researching-root-of-epilepsy/>

M. OTHERS

1. Quality Matters Teaching Online Certificate, April 27th, 2022.
2. Society for Industrial and Applied Mathematics Workshop on Network Science Early Career Travel Award (SIAM, NSF), 2015.
3. Society for Neuroscience Member, 2011 – 2012.
4. Department of Electrical and Computer Engineering nomination for Clarkson University 2009 Outstanding Teaching Award for a Graduate Student, 2010.
5. International Joint Conference on Neural Networks Student Travel Grant (IEEE), 2003 and 2007.
6. IEEE Senior Member (S’03–M’10–SM’17), 2003 – Present.