

Eleni Gourgou, PhD
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Mechanical Engineering Department
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Education

2011: Doctor of Philosophy (PhD) in Animal Physiology; Department of Biology, National & Kapodistrian University of Athens, Greece.
Thesis: "Signal transduction mechanisms in marine invertebrates". Advisor: C. Gaitanaki.

2003: B.S. in Biology; Department of Biology, National & Kapodistrian University of Athens, Greece.
Research Thesis: "On the relation between energetics and tail autotomy capacity in greek [lizard] species of the genus *Podarcis*". Advisor: E. Valakos.

Research Interests

Neurobiology of memory and learning; Behavioral neurogenetics; Use of controlled, engineered microenvironments to interrogate the nervous system; Mathematical models of biological systems; Locomotion dynamics; Technology (3D printing, microfluidics, nanoparticles) and engineering (image processing, computer vision, data analytics) applications on neurobiology; Multi-scale dynamics of biological systems, emphasis on neurons and neuronal circuits; Neuronal physiology and calcium dynamics; Cell physiology, signal transduction and stress.

Academic Positions

University of Michigan, United States

2016-today: Assistant Research Scientist, Mechanical Engineering.

2015-2016: Senior Research Fellow, Ao-Lin Hsu Lab, Internal Medicine, Division of Geriatrics and Palliative Medicine, Medical School.

2014-2016: Senior Research Fellow, Bogdan Epureanu Group, Mechanical Engineering.

2011-2014: Research Fellow, Nikos Chronis Lab, Mechanical Engineering.

National & Kapodistrian University of Athens, Greece

2005-2010: Lab Assistant, Department of Biology.

Honors and Awards

A7. Willie Hobbs Moore Aspire, Advance and Achieve Award, U-M Women in Science and Engineering (WISE). Award recognizes individuals who have served as an outstanding formal or informal mentor to students. EG selected "*because of [her] outstanding efforts to support the professional advancement of [her] many graduate and undergraduate student researchers and commitment to recruit students underrepresented in STEM*", **2021**.

A6. Outstanding Team Presentation Award, Interstellar Initiative, New York Academy of Sciences (NYAS) and the Japan Agency for Medical Research and Development (AMED), *awarded to 2 out of 10 teams*, New York City, NY, USA, **2019**.

A5. 2nd place Best Poster Award, undergraduate category: Goettemoeller A., **Gourgou E.**, Hsu A-L.: "The effect of calorie restriction on *C. elegans* spatial learning in T-mazes". 7th Midwest *C. elegans* meeting, Ann Arbor, Michigan, USA, **2019**.

A4. Career Development Award (K01), National Institutes of Health (NIH), National Institute of Aging (NIA): "Deciphering aging-driven cognitive decline in *C. elegans* spatial memory and learning through an interdisciplinary approach", **2018**.

A3. Travel Award, Institute for Mathematics and its Applications (IMA), Workshop for Women in Mathematical Biology, University of Minnesota, Minneapolis, MN, USA, **2018**.

A2. Honorary Oath Pronunciation, Commencement Ceremony of Doctorate Laureates, University of Athens, Greece, **2011**.

A1. Onassis Foundation Scholarship for *2003 Lectures in Biology*, Foundation of Research and Technology, Iraklion, Crete, Greece, **2003**.

Publications

underlined: mentored by EG

Full articles in refereed journals[#]

J11. Sakelaris B., Li Z., Sun J., Banerjee S., Booth V., **Gourgou E.***: "Modelling learning in *C. elegans* chemosensory and locomotive circuitry for T-maze navigation", ***: corresponding author**. *Under revision*.

J10. Cardoza S.N., Tse L.Y.L., Barton K., **Gourgou E.***: "3-dimensional arenas for the assessment of *C. elegans* behavior", ***: corresponding author**. *Under revision*.

J9. **Gourgou E.***, Mirzakhali E., Zhang Y., Epureanu B.: "The effect of internalized paramagnetic nanoparticles on *Caenorhabditis elegans* locomotion in the presence of magnetic field", ***: corresponding author**. *Under revision*.

J8. **Gourgou E.***, Adiga K., Goettemoeller A., Chen C., Hsu A-L*.: " *Caenorhabditis elegans* learning in a structured maze is a multisensory behavior", ***: co-corresponding authors**. *iScience*, 24 (4) 102284, doi: <https://doi.org/10.1016/j.isci.2021.102284>, **2021**. IF: 4.447

J7. Mirzakhali E., Epureanu B., **Gourgou E.***: "A mathematical and computational model for Ca²⁺ dynamics in *C. elegans* ASH sensory neuron", *PLoS ONE* 13(7): e0201302. <https://doi.org/10.1371/journal.pone.0201302>, ***: corresponding author, 2018**. IF: 2.766

J6. Ghadami A., **Gourgou E.**, Epureanu B.: "Rate of recovery from perturbations as a means to forecast future stability of living systems", *Scientific Reports*, 8, 9271; doi: <https://doi.org/10.1038/s41598-018-27573-0>, **2018**. IF: 4.122

J5. Mirzakhali E., **Gourgou E.**, Booth V., Epureanu B.: "Synaptic Impairment and Robustness of Excitatory Neuronal Networks with Different Topologies". *Frontiers in Neural Circuits* 11:38. doi: 10.3389/fncir.2017.00038; **2017**. IF: 3.005

J4. **Gourgou E.**, Chronis N.: "Chemically induced oxidative stress affects ASH neuronal function and behavior in *C. elegans*". *Scientific Reports*, 6, 38147; doi: 10.1038/srep38147, **2016**. IF: 4.259

J3. Oliver R.C., **Gourgou E.**, Bazopoulou D., Chronis N., Hart A.J.: "On-demand isolation and manipulation of *C. elegans* by *in vitro* maskless photopatterning". *PLoS ONE*, 11(1): e0145935. doi: 10.1371/journal.pone.0145935, **2016**. IF: 2.806

J2. **Gourgou E.**, Aggeli I-K., Beis I., Gaitanaki C.: "Hyperthermia-induced Hsp70 and MT20 transcriptional upregulation is mediated by p38-MAPK and JNKs in *Mytilus galloprovincialis* (Lamarck); a pro-survival response". *Journal of Experimental Biology*, 213: 347-57, **2010**. IF: 3.040

J1. Kefaloyianni E., **Gourgou E.**, Ferle V., Kotsakis E., Gaitanaki C., Beis I.: "Acute thermal stress and various heavy metals induce tissue-specific pro- or anti-apoptotic events via the p38-MAPK signal transduction pathway in *M. galloprovincialis*". *Journal of Experimental Biology*, 208:4427-36, **2005**. IF: 2.712

[#]The Impact Factor (IF) indicated for each journal is the IF of the publication year, according to www.scijournal.org.

Non-research journal publications

E1. Gourgou E.*, Willis A.R., Giunti S., De Rosa M.J., Charlesworth A.G., Hernandez Lima M., Glater E., Soo S., Pereira B., Akbaş K., Deb A., Kamak M., Moyle M.W., Traa A., Singhvi A., Sural S., Jin E.J.: "A journey to "tame a small metazoan organism", seen through the artistic eyes of *C. elegans* researchers". *Journal of Neurogenetics*, Special Issue: Nature's Gift to Neuroscience, DOI:10.1080/01677063.2020.183944 ***: corresponding author, 2020**. IF: 1.536

Articles currently published in preprint servers

R1. Gourgou E., Zhang Y., Mirzakhali E., Epureanu B.: "*Caenorhabditis elegans* locomotion dynamics is affected by internalized paramagnetic nanoparticles in the presence of magnetic field". bioRxiv <https://doi.org/10.1101/248369>, **2019**.

Publications in preparation

P6. Gourgou E.*#, Hsu A.-L.#: "Mazes for *Caenorhabditis elegans* behavior and learning", ***technical contact, #: co-corresponding authors**, in preparation.

P5. Schiavone M. #, Zhang Z.#, Gourgou E.*: "Anatomy of pirouettes in aging *C. elegans*", ***: corresponding author, #: equal contributions; in preparation**.

P4. Akbaş K.#, Donato C. #, Schiavone M. #, Zhang Z.#, Branch E., Archer E., Mummolo C.*, **Gourgou E.*:** "Control theory and dynamical systems theory as comparative tools for locomotion analysis", ***: co-corresponding authors, #: equal contributions; in preparation**.

P3. Bittner B., Kraus J., Schiavone M., Gourgou E.*, Revzen S.*: "*C. elegans* locomotion gait properties through the lens of a worm phase estimator", ***: co-corresponding authors; in preparation**.

P2. Ivanitskiy M., Booth V.*, Gourgou E.*: "A mathematical model of synaptic plasticity and proprioceptive feedback in *C. elegans* navigation circuitry", ***: co-corresponding authors; in preparation**.

P1. Gourgou E., A.L. Hsu: "Dietary restriction in interacting *C. elegans* populations", in preparation.

Presentations in refereed conferences (most 2020 conferences were canceled due to covid-19)

C22. Cardoza S., Tse LYL, Branch E., Barton, K., **Gourgou E.:** "3-dimensional behavioral arenas for *C. elegans*". 23rd *C. elegans* International Meeting, Genetics Society of America, virtual, USA, **2021 ***.

C21. Gourgou E. #, Goettemoeller A., Chen C., Fretz A., Hsu AL#.: "*C. elegans* learning strategy in T-mazes and aging-related interventions". 23rd *C. elegans* International Meeting, Genetics Society of America, virtual, USA, **2021 ***. ***: co-corresponding authors**.

C20. Sakelaris B.¹, Adiga K.¹, Goettemoeller A.¹, Chen C., Booth V., Hsu A.L.#, **Gourgou E.#:** "*C. elegans* multisensory learning in simple T-mazes, as revealed by experiments and captured by mathematical models". 49th Neuroscience meeting, Society for Neuroscience (SfN), Chicago, IL, USA, **2019**. ¹: equal contributions; ***: co-corresponding authors. (selected talk) ***.

C19. Gourgou E. #, Adiga K., Goettemoeller A., Chen C., Hsu AL#.: "Can *C. elegans* learn to navigate in a maze? A story of food-triggered, touch-governed spatial learning". 22nd *C. elegans* International Meeting, Genetics Society of America, Los Angeles, CA, USA, **2019 ***. ***: co-corresponding authors**

C18. Banerjee S., Dhiman V., Corso J., **Gourgou E.:** "Using computer vision to decipher *C. elegans* locomotion before and after training in T-mazes". 22nd *C. elegans* International Meeting, Genetics Society of America, Los Angeles, CA, USA, **2019***.

C17. Sakelaris B., Clayborn D., Booth V., Gourgou E.: "How do nematodes navigate in T-mazes? Mathematical models of the neuronal circuits that steer *C. elegans* learning and decision making". 22nd *C. elegans* International Meeting, Genetics Society of America, Los Angeles, CA, USA, **2019***.

- C16.** Cardoza S., Tse LYL, Barton, K., **Gourgou E.**: "Advancing behavioral arenas for small model organisms by 3D printing nematode growth medium". 22nd *C. elegans* International Meeting, Genetics Society of America, Los Angeles, CA, USA, **2019***.
- C15.** Ghadami A., **Gourgou E.**, Epureanu B.: "Rate of Recovery from Perturbations Reflects Future Stability of Natural Populations". ICCS, 9th International Conference on Complex Systems, Cambridge, MA, USA, **2018 (selected talk) ***.
- C14.** **Gourgou E.**, Adiga K., Hsu AL.: "*C. elegans* learning and decision making in T-shaped mazes". *C. elegans* Topic Meeting-CeNeuro: Neuronal Development, Synaptic Function and Behavior, Madison, WI, USA, **2018 (selected talk) ***.
- C13.** Ghadami A., **Gourgou E.**, Epureanu B.: "Forecasting Critical Transitions and Bifurcation Diagrams of Natural Populations". American Physical Society (APS) March Meeting, Los Angeles, CA, USA, *Bulletin of the American Physical Society*, Abstract: P49.00005, **2018 (selected talk)**.
- C12.** Mirzakhilili E., Epureanu B., **Gourgou E.**: "A mathematical model for Ca²⁺ dynamics in *C. elegans* ASH sensory neuron". 21st *C. elegans* International Meeting, Genetics Society of America, Los Angeles, CA, USA, **2017***.
- C11.** Mirzakhilili E., **Gourgou E.**, Epureanu B.: "Synaptic Deficiencies and Robustness of Excitatory Neuronal Networks". International Conference of Mathematical Neuroscience 2017, Boulder, CO, USA, **2017***.
- C10.** Mirzakhilili E., **Gourgou E.**, Epureanu B.: "Transport by a kinesin in the presence of magnetic nanoparticles". Biophysical Society 59th Meeting, Baltimore, MD, USA, *Biophysical Journal*, Volume 108, Issue 2, Supplement 1, p137a, **2015**.
- C9.** **Gourgou E.**, Mirzakhilili E., Epureanu B.: "Magnetic field effects on *C. elegans* locomotive behavior". 20th *C. elegans* International Meeting, Genetics Society of America, Los Angeles, CA, USA, **2015***.
- C8.** **Gourgou E.**¹, Oliver C.R.¹, Bazopoulou D., Chronis N., Hart A.J.: "Real-time behavioral study of *C. elegans* by dynamic *in situ* photopatterning of hydrogel assays". 20th *C. elegans* International Meeting, Genetics Society of America, Los Angeles, CA, USA, **2015***. **¹equal contributions.**
- C7.** **Gourgou E.**, Chronis N.: "Chemically induced oxidative stress affects ASH neuronal function & *C. elegans* behavior". 20th *C. elegans* International Meeting, Genetics Society of America, Los Angeles, CA, USA, **2015***.
- C6.** Oliver R.C., **Gourgou E.**, Bazopoulou D., Chronis N., Hart A.J.: "Platform for *in-vitro* photopatterning of whole animal *C. elegans* assays and behavior control". 18th International μ TAS Conference, San Antonio, TX, USA, **2014***.
- C5.** **Gourgou E.**, Bazopoulou D., Chronis N.: "Paraquat-induced oxidative stress affects the function of the ASH chemosensory neuron in *C. elegans*". *C. elegans* Neurobiology, European Molecular Biology Organization (EMBO) Conference Series, European Molecular Biology Laboratory (EMBL) Heidelberg, Germany, **2012***.
- C4.** **Gourgou E.**, Meletiou A., Beis I., Gaitanaki C.: "Protection mechanisms against oxidative stress in *Mytilus galloprovincialis*". 25th Congress of the ^{new}European Society of Comparative Biochemistry and Physiology, Ravenna, Italy, *Comparative Biochemistry and Physiology Part A* 151, Number 1/Suppl. pS9, doi: 10.1016/j.cbpa.2008.05.068, **2008**.
- C3.** **Gourgou E.**, Beis I., Gaitanaki C.: "Transcription factors activation by hyperthermia in *Mytilus galloprovincialis*". 33rd FEBS Congress & 11th IUBMB Conference, Athens, Greece, *FEBS Journal*, 275 (Suppl.1) p122, PP2A-24, **2008**.
- C2.** **Gourgou E.**, Gaitanaki C., Beis I.: "Thermal stress induces anti-apoptotic events via the p38-MAPK pathway in *Mytilus galloprovincialis*". 31st FEBS Congress, Istanbul, Turkey, *FEBS Journal*, 273 (Suppl.1) p114, PP-141, **2006**.

C1. Gourgou E., Kefaloyianni E., Gaitanaki C., Beis I.: "Heavy metals and thermal stress induce pro- and anti-apoptotic events via the p38-MAPK signal transduction pathway in *Mytilus galloprovincialis*". Cell Signaling World, Signal transduction pathways as therapeutic targets, Luxembourg, Luxembourg, **2006***.

*Items presented at conferences that do not publish formal proceedings (majority of biology-related conferences); oral and poster presentations appear only in the abstract book.

Presentations in non-refereed conferences (many 2020 conferences canceled due to covid-19)

N17. Schiavone M., Zhang Z., **Gourgou E.**: "Multiple event-based and bipedalism-inspired analysis of *C. elegans* locomotion". 8th Midwest *C. elegans* meeting, virtual, USA, **2021**.

N16. Fretz A., LaMonica A., Goettemoeller A., Chen C., Hsu A., **Gourgou E.**: "Aging-related genetic interventions in *C. elegans* maze learning". 8th Midwest *C. elegans* meeting, virtual, USA, **2021**.

N15. Goettemoeller A., **Gourgou E.**, Hsu A.: "The effect of calorie restriction on *C. elegans* spatial learning in T-mazes". 7th Midwest *C. elegans* meeting, Ann Arbor, Michigan, USA, **2019**. *2nd place Best Poster Award, undergraduate category*.

N14. Motheram H., Hsu A., **Gourgou E.**: "Environmental and Systematic Factors that Influence *C. elegans* Behavioral Protocols". 7th Midwest *C. elegans* meeting, Ann Arbor, Michigan, USA, **2019**.

N13. Sakelaris B., Clayborn D., Booth V., **Gourgou E.**: "Building mathematical models to decipher the neuronal circuits that steer *C. elegans* learning and decision making in T-mazes". 7th Midwest *C. elegans* meeting, Ann Arbor, Michigan, USA, **2019**.

N12. **Gourgou E.**: "*C. elegans* neurobiology, behavior and biological systems dynamics". 6th Midwest *C. elegans* meeting, Ypsilanti, Michigan, USA, **2018**.

N11. Zhang Y., Mirzakhali E., Epureanu B., **Gourgou E.**: "Internally localized magnetic fields affect *C. elegans* locomotion dynamics". 6th Midwest *C. elegans* meeting, Ypsilanti, Michigan, USA, **2018**.

N10. Hingorani R., **Gourgou E.**: "Toward barcoding individual worms". 6th Midwest *C. elegans* meeting, Ypsilanti, Michigan, USA, **2018**.

N9. Bazopoulou D., **Gourgou E.**, Chronis N.: "A Microfluidic-Based, Drug Screening Platform for the *In Vivo* Discovery of Enhancers of Neuronal Function in Aged *C. elegans*". Society for Laboratory Automation and Screening 2014, 3rd Annual Conference & Exhibition, San Diego, CA, USA, **2014**.

N8. **Gourgou E.**, Chronis N.: "Paraquat-induced oxidative stress affects the function of ASH chemosensory neuron in *C. elegans*". 1st Michigan *C. elegans* meeting, Holland, Michigan, USA, **2013**.

N7. Simou C., Stathopoulou K., **Gourgou E.**, Pafilis P., Gaitanaki C., Valakos E.: "Tail regeneration in lizards *Podarcis* and predation and habitat effect". Hellenic Society for Biological Sciences, 30th Scientific Conference, Greece, **2008**.

N6. **Gourgou E.**, Gaitanaki C., Beis I.: "JNK-MAPKs and transcriptional factors activation in *Mytilus galloprovincialis*". Hellenic Society for Biological Sciences, 29th Scientific Conference, Greece, **2007**.

N5. **Gourgou E.**, Gaitanaki C., Beis I.: "Seasonal thermal stress affecting signal transduction pathways in *M. galloprovincialis*". Hellenic Society for Biological Sciences, 28th Scientific Conference, Greece, **2006**.

N4. **Gourgou E.**, Gaitanaki C., Beis I.: "Effect of oxidative and thermal stress on transcription and translation of Hsp70 and metallothioneins genes in *Mytilus galloprovincialis*". Hellenic Society for Biological Sciences, 27th Scientific Conference, Greece, **2005**.

N3. Gaitanaki C., Kefaloyianni E., Kotsakis E., Ferle V., **Gourgou E.**, Beis I.: "Effect of heavy metals on MAPKs signaling pathways of *Mytilus galloprovincialis*". Hellenic Society for Biological Sciences, 26th Scientific Conference, Greece, **2004**.

N2. Pafilis P., Sampson A., Stamatiou P., **Gourgou E.**, Gaitanaki C., Valakos E.: "Temperature's influence on the digestive efficiency in *Podarcis peloponnesiaca* and *Podarcis erhardii*". 4th International Symposium on the Lacertids of the Mediterranean Basin, Menorca, Spain, **2001**.

N1. Stamatiou P., **Gourgou E.**, Pafilis P., Valakos E.: "Temperature's influence on the digestive efficiency in greek lizards". Hellenic Society for Biological Sciences, 23rd Scientific Conference, Greece, **2001**.

Presentations in symposia & workshops (*many 2020 meetings canceled due to covid-19*)

O19. Jaimee M., **Gourgou E.**: "Data analysis of behavioral experiments recordings". UROP** Virtual Symposium, University of Michigan, Ann Arbor, MI, USA, **2020**. *Awarded UROP** Blue Ribbon, for "exemplary research presentation"*.

O18. Branch E., **Gourgou E.**: "Genetic background and training patterns in invertebrate spatial learning". UROP** Virtual Symposium, University of Michigan, Ann Arbor, MI, USA, **2020**.

O17. LaMonica A., **Gourgou E.**: "Behavior, maze navigation and spatial learning in *C. elegans* nematodes". UROP** Virtual Symposium, University of Michigan, Ann Arbor, MI, USA, **2020**.

O16. Abdul H., **Gourgou E.**: "Design and manufacturing of a 3D rotary microscope base", RISE+ Undergraduate Symposium, University of Michigan, Ann Arbor, MI, USA, **2019**.

O15. Sakelaris B.¹, Adiga K.¹, Goettemoeller A.¹, Chen C., Booth V., Hsu A.L.[#], **Gourgou E.**[#]: "*C. elegans* multisensory learning in simple T-mazes". Advances in Health and Aging Research Across the Translational Spectrum, Joint Symposium of University of Michigan-Michigan State University-Wayne State University, Ann Arbor, MI, USA, **2019**. ¹: equal contributions; [#]: corresponding authors.

O14. Motheram H., Hsu A., **Gourgou E.**: "Environmental and Systematic Factors that Can Influence *C. elegans* Behavioral Protocols". UROP** Symposium, University of Michigan, Ann Arbor, MI, USA, **2019**.

O13. Woodberry H., **Gourgou E.**: "Training patterns impact on *C. elegans* spatial learning". UROP** Symposium, University of Michigan, Ann Arbor, MI, USA, **2019**.

O12. Cardoza S., Tse LYL, Barton, K., **Gourgou E.**: "Advanced behavioral arenas for small model organisms by 3D printing nematode growth medium", Michigan Engineering Design Expo, Ann Arbor, MI, USA, **2019**.

O11. Cardoza S., Tse LYL, Barton, K., **Gourgou E.**: "Advancing behavioral arenas for small model organisms by 3D printing nematode growth medium", Michigan Undergraduate Research Symposium, UROP, Michigan Engineering Honors Program and Perch Education, Ann Arbor, Michigan, MI, USA, **2019**.

O10. **Gourgou E.**: "Tiny worms solve T-mazes to untangle spatial learning and aging", Advances in Health and Aging Research Across the Translational Spectrum, Joint Symposium of University of Michigan-Michigan State University-Wayne State University, Ann Arbor, MI, USA, **2018**.

O9. Mirzakhali E., Epureanu B., **Gourgou E.**: "A mathematical and computational model for Ca^{2+} dynamics in *C. elegans* ASH sensory neuron", Institute for Mathematics and its Applications (IMA), Workshop for Women in Mathematical Biology, University of Minnesota, Minneapolis, MN, USA, **2018**.

O8. **Gourgou E.**, Adiga K., Chen C., Hsu AL.: " *C. elegans* learning and decision making in T-shaped mazes", 12th Annual Geriatrics Center Research Symposium, University of Michigan, Ann Arbor, MI, USA, **2018**.

O7. Woodberry H., **Gourgou E.**: "Using mazes to explore spatial navigation and learning in worms". UROP** Symposium, University of Michigan, Ann Arbor, MI, USA, **2018**.

O6. Cardoza S., **Gourgou E.**: "Design and Production of Behavioral Assays on *C. elegans*". UROP** Symposium, University of Michigan, Ann Arbor, MI, USA, **2018**.

O5. Mirzakhali E., **Gourgou E.**, Epureanu B.: "Data-driven computational model of the calcium dynamics in *Caenorhabditis elegans* ASH sensory neuron". Michigan Institute for Computational Discovery and Engineering (MICDE) Symposium, Ann Arbor, MI, USA, **2017**.

O4. Mirzakhali E., **Gourgou E.**, Epureanu B.: "Neuronal Network Robustness and Synaptic Deficiencies in the Brain". Advancing Precision Medicine through Complex Systems Biology Symposium, University of Michigan Center for the Study of Complex Systems, Ann Arbor, MI, USA, **2016**.

O3. Mirzakhali E., **Gourgou E.**, Epureanu B.: "Neuronal Network Robustness: Where to Look for Synaptic Deficiencies in the Brain". Engineering Graduate Symposium, University of Michigan, Ann Arbor, MI, USA, **2016**.

O2. **Gourgou E.**, Chronis N.: "A microfluidic platform used to study chemically induced oxidative stress on a *C. elegans* sensory neuron". 8th MBSTP Symposium (Microfluidics in Biomedical Sciences Training Program-University of Michigan), Ann Arbor, MI, USA, **2013**.

O1. **Gourgou E.**, Bazopoulou D., Chronis N.: "A microfluidic device used to study the effects of oxidative stress on a *C. elegans* sensory neuron". 7th MBSTP Symposium (Microfluidics in Biomedical Sciences Training Program-University of Michigan), Ann Arbor, MI, USA, **2012**.

**URO: Undergraduate Research Opportunity Program, University of Michigan.

+RISE: Research, Innovation, Service and Entrepreneurship program for undergraduate students, Mechanical Engineering Dept, University of Michigan.

Books

B2. Glenis S., Babilis N., **Gourgou E.**, Oikonomou K.: "Biology", for Senior High School students (Patakis Eds, *in Greek*, ISBN: 960-16-0636-1, pages: 363), **2003**.

B1. Glenis S., **Gourgou E.**, Evagelatou A., Babilis N.: "Biology", for Senior High School students (Patakis Eds, *in Greek*, ISBN: 978-960-16-0306-3, pages: 159), **2002**.

Invited & Seminar Series talks

I4. "*C. elegans* navigation and learning in structured environment, as revealed by experiments and mathematical models"; Biomedical Engineering Department Seminar Series, **New Jersey Institute of Technology (NJIT)**, New Jersey, NJ, virtual- **2020**.

I3. "*C. elegans* learning and decision-making in a structured environment"; Neurology/Neuroscience Seminar Series, **UoM Medical School**, Council for Continuing Medical Education, **2019**.

I2. "Characterization of *C. elegans* spatial learning". J. Alcedo Lab, Dept. of Biological Sciences, **Wayne State University**, Detroit, MI, **2018**.

I1. "Investigating *C. elegans* neurophysiology and behavior under oxidative stress, and other stories". B. Bamber and R. Komuniecki Labs, Dept of Biology, **University of Toledo**, Toledo, OH, **2014**.

Teaching

ME: Mechanical Engineering; EECS: Electrical Engineering & Computer Science; CSE: Computer Science & Engineering; BME: Biomedical Engineering; UMSI: School of Information; LSA: Literature, Science, and the Arts; Med: Medical School, CoE: College of Engineering

Students Mentoring (University of Michigan, unless stated otherwise)

~~~Dissertation Committees~~~

D3. Amin Ghadami, ME; Chair: B. Epureanu, "Anticipating Bifurcations for Identifying Dynamic Characteristics of Complex Systems"; **Committee member, 2019**.

D2. Ehsan Mirzakhali, ME; Chair: B. Epureanu, "Dynamics of neural systems: From Intracellular Transport in Neurons to Network Activity"; **Committee member, 2018**.

D1. Amrita Ray-Chaudhury, BME; Chair: N. Chronis, "Bio-Micro-Systems for Diagnostic Applications, Disease Prevention & Creating Tools for Biological Research"; **Committee member, 2018**.

~~~Graduate students~~~

~PhD students

**S56.** Brian Bittner, EECS, *collaboration on project related to PhD topic: "Geometric gait optimization tools to decipher *C. elegans* locomotion"*, **Mentor**; PhD Advisor: S. Revzen (EECS), **2018-2021**.

**S55.** Shurjo Banerjee, EECS, *collaboration on project independent of PhD topic: "Computer vision and video analysis to decipher *C. elegans* behavior in mazes"*, **Mentor**; PhD Advisor: J. Corso (EECS), **2018-2020**.

**S54.** Vikas Dhiman, EECS, *collaboration on project independent of PhD topic: "Computer vision and video analysis to decipher *C. elegans* behavior in mazes"*, **Mentor**; PhD Advisor: J. Corso (EECS), **2018**.

**S53.** Amin Ghadami, ME, *mentoring related to PhD topic: "Anticipating bifurcations in complex nonlinear systems"*, **Co-mentor**; PhD Advisor: B. Epureanu (ME), **2016-2019**.

**S52.** Ehsan Mirzakhali, ME, *mentoring related to PhD topic: "Dynamics of neural systems: From Intracellular Transport in Neurons to Network Activity"*, **Co-mentor**; PhD Advisor: B. Epureanu (ME), **2014-2018**.

~Master's students

**Role: Mentor** (unless stated otherwise)

**S51.** Maria Schiavone, ME: "*C. elegans* locomotion features affected by aging and genetic background", **2019**(undergrad)-**today**. *William Mirsky Memorial Fellowship, 2020: Presented to two U-M ME Master's students who have shown outstanding research and high academic achievement.*

**S50.** Srinivasa Cheekati, EECS: "A custom system for 3D imaging of behavioral assays", **2020**; Sponsor for ISD503, **2021**.

**S49.** Jiawei Sun, EECS, EECS599-Directed study (sponsor): "Data analytics on neurobiology behavioral experiments", **2019-2020**.

**S48.** Zongyu Li, EECS, EECS599-Directed study (sponsor): "Data analytics and tracking algorithms on neurobiology behavioral experiments", **2019-2020**.

**S47.** Snehal Prabhudesai, EECS: "*C. elegans* locomotion and mechanical forces", **2019**.

**S46.** Bo Xue, EECS, EECS599-Directed study (sponsor): "Using image processing and machine learning to identify fluorescent worms", **2018-2019**.

~~~Post-graduation research assistants~~~ (mentor, unless stated otherwise)

S45. Michael Ivanitskiy, Graduate of Dept of Mathematics: "Modeling *C. elegans* synaptic plasticity and proprioceptive feedback", **Shared mentoring** with V. Booth, Dept of Mathematics, **2021-today**.

S44. Abrielle Fretz, Graduate of Dept of Integrative Physiology & Molecular Biology: "*C. elegans* spatial behavior in the context of aging and lifespan extension", **2019-today**.

~~~Visiting Research Assistants~~~ (mentor, unless stated otherwise)

**S43.** Marie-Beatrix Kruth, Internal Medicine Dept, Medical School: "Spatial navigation in *C. elegans*", **Co-mentor**; Advisor: A-L. Hsu (Med), **2017**.

**S42.** Chieh Chen, Internal Medicine Dept, Medical School: "Using mazes to study memory and aging in *C. elegans*", **Co-mentor**; Advisor: A-L. Hsu (Med), **2016**.

~~~Mixed Team of Graduate & Undergraduate Students~~~ (mentor, unless stated otherwise)

S37-S41. FEAST/MDP (Faculty Engineering & Arts Student Team & Multidisciplinary Design Program), group of 5 students: Sara Huang (LSA), Jaehong Min (First Year CoE), Alexander Reynolds (BME), Mirella Hernandez Lima (Neuroscience PhD), Richard Wall (ME). "LuCelegans: The Interactive Worm Project", **2021-today**.

~~~Undergraduate students~~~

**Role: Mentor** (unless stated otherwise)

**S33-36. ME450** (sponsor), group of 4 students (Aoqian Zhang, Kevin Wen, Karthik Bijoy, Yuxuan Ye): "A 2D clinostat to perform reduced gravity biological experiments", **2020-today**.

**S32.** Zijun Yuan, EECS: "Mapping Nematode Growth Medium properties for 3D-printing applications", **2020**.

**S31.** Eric Chandler, EECS: "gCode and parsers for use with custom hydrogel-based 3D printer", **2020**.

**S30.** Hongru Lu, EECS: "Coding for use with a customized hydrogel-using 3D printer", **2020-2021**.

**S29.** Zhaoyuan Zhang, EECS: "Customization of a nematode tracking algorithm for comparative aging studies", **2020-today**.

**S23-S28. ArtsEngine Project**, multidisciplinary group of 6 students (Fee Cristoph, Arts&Design & CSE; Manali Desai, UMSI and Arts&Design; Amanda Taylor, Arts&Design and Socio-Anthropology; Melinda Li, ME; Richard Wall, ME; Jiwen Chen, ME): "LuCelegans: a 3-dimensional, interactive prototype of *C. elegans* connectome", **2019-2020**.

**S22.** Emily Branch, LSA: "Genetic background and training patterns in invertebrate spatial learning", UROP\*\* student, **2019-2020**; Assistant in Research, **2020-today**.

**S21.** George Grosvenor, LSA: "Behavior, maze navigation and spatial learning in *C. elegans* nematodes", UROP\*\* student, **2019-2020**.

**S20.** Allison LaMonica, LSA: "Behavior, maze navigation and spatial learning in *C. elegans* nematodes", UROP\*\* student, **2019-2020**; UROP\*\* Research Scholar, **2020-today**.

**S19.** Jaimee Moline, BME: "Data analysis of behavioral experiments recordings"; UROP\*\* student, **2019-2020**.

**S18.** Robert Martinez, ME: "Design and manufacturing of a 3D rotary microscope base", **2019**.

**S17.** Abdul Hasib, ME: "Design and manufacturing of a 3D rotary microscope base", RISE+ student (shadow tenured faculty: Nikos Chronis), **2019**.

**S16.** Himaja Motheram, LSA: "Systematic and environmental factors that affect *C. elegans* behavioral assays", UROP\*\* student, **2018-2019**.

**S15.** Steel Cardoza, MSE: "3D printing technology and design for exploring spatial navigation and learning in *C. elegans*", UROP\*\* student, **2017-2018**; Assistant in Research, **2018-2020**.

**S14.** Bennet Sakelaris, Applied Mathematics Honors Program, Dept of Mathematics: "Modeling *C. elegans* sensory and locomotion neural circuits, involved in learning", **Shared mentoring** with V. Booth, Dept of Mathematics, **2018-2020**.

**S13.** Drew Clayborn, Dept of Mathematics: "Modeling *C. elegans* locomotion neural circuit", **Shared mentoring** with V. Booth, Dept of Mathematics, **2018**.

**S12.** Hijiri Woodberry, BME: "Using mazes to explore spatial learning and memory after training in *C. elegans*", UROP\*\* student, **2017-2018**; UROP\*\* Research Scholar, **2018-2019**.

**S11.** Rahul Hingorani, EECS: "Fluorescent labelling of *C. elegans* populations", Assistant in Research, **2017-2018**.

**Role: Co-advisor**

**S10.** Lamia Ahmed, Molecular, Cellular & Developmental Biology Dept, Neuroscience Program: "Spatial learning in aging *C. elegans*", **Co-advisor**; Mentor: A-L. Hsu (Medical School), **2017-2018**.

**S9.** Anne Goettemoeller, Neuroscience Honors Program: "Time-frame of short-term spatial memory retention in *C. elegans*", **Co-advisor**; Mentor: A-L. Hsu (Medical School), **2016-2019**.

**S8.** Yang Zhang, EECS: "*C. elegans* locomotion dynamics: tracking algorithms and data analysis", **Co-advisor**; Mentor: B. Epureanu (ME), SURE\*\*\* student, **2016-2017**.

**S7.** Kavya Adiga, Molecular, Cellular & Developmental Biology Dept: "Memory and spatial navigation in *C. elegans*", **Co-advisor**; Mentor: A-L. Hsu (Medical School), **2015-2017**.

**S6.** Syeda Maisa, ME: "Recording, analyzing and processing a model organism's locomotion under magnetic field", **Co-advisor**; Mentor: B. Epureanu (ME), SURE\*\*\* student, **2015**.

\*\*URO: Undergraduate Research Opportunity Program, University of Michigan.

\*\*\*SURE: Summer Undergraduate Research in Engineering, University of Michigan.

+RISE: Research, Innovation, Service and Entrepreneurship program for undergraduate students, Mechanical Engineering Dept, University of Michigan.

**Role: Lab supervisor** (Dept of Biology, University of Athens, Greece)

**S5.** Anastasia Meletiou: "Antioxidant enzymes under stress in *M. galloprovincialis*", **2006-2008**.

**S4.** Andriani Paraschi: "Apoptotic mechanisms under stress in *M. galloprovincialis*", **2006-2008**.

**S3.** Ismini Papanikolaou: "Signal transduction and seasonal stress in *M. galloprovincialis*", **2003-2005**.

**S2.** Vicky Nikolaidou: "Upregulation of heat shock protein HSP70 in *M. galloprovincialis*", **2003-2005**.

**S1.** Panayiota Makri: "Oxidative stress and apoptotic/protective mechanisms in *M. galloprovincialis*", **2003-2005**.

### Guest Lectures

**L4.** "Navigation and nonvisual sensory modalities", Course: ME599-004/ROB599-002-BioInspiration, 1 lecture; Instructor: Talia Moore, Mechanical Engineering Dept & Robotics Institute, WN **2021**.

**L3.** "Microfluidics in Mechanobiology" and "Droplet microfluidics applications in biochemistry and molecular biology", 2 lectures; Course: MECHENG 599-BioMEMs, Instructor: Nikos Chronis, Mechanical Engineering Dept, WN **2020**. *Teaching evaluations available; Overall mean score: 4.9/5*

**L2.** "Mechanobiology of small invertebrate animal models", 1 lecture; Course: MECHENG 599-Cellular Engineering, Instructor: Allen Liu, Mechanical Engineering Dept, WN **2018**.

**L1.** "Emerging Topics in Bioengineering", 1 lecture; Course: ARCH 575-Building Ecology, Instructor: Jong Jin Kim, Taubman College of Architecture and Urban Planning, WN **2014**.

### Short courses, workshops and lab courses

**W5. K Award Writing Workshop Series**, Michigan Institute for Clinical and Health Research (MICHR): **Faculty Facilitator and Mentor**, Ann Arbor, MI, USA, **2020, 2021**(virtual).

**W4. Undergraduate Education Workshops Program**, Undergraduate Research Opportunity Program (URO), University of Michigan, Brown Bag Speakers Series; Session topic: "Interdisciplinary Research in Biological Sciences", Ann Arbor, MI, USA, **2019**.

**W3. "High-Impact Principles and Practices for STEM Education" online course** (HIP4STEM), University of Michigan Center for Research on Learning and Teaching (CRLT): **Mentor**, Ann Arbor, MI, USA, **2016**.

**W2. Animal Physiology, lab series: Lab assistant**, University of Athens, Greece, **2004-2008**.

**W1. Immunology, lab series: Lab assistant**, University of Athens, Greece, **2004-2008**.

### Other mentoring and teaching activities

**T2. Mock Study Section for NIH & VA proposals**, UM Medical School Research Education Core Retreat, UM Pepper Center-Michigan Alzheimer's Disease Center Retreat, **participant, and proposal reviewer**, **2019**.

**T1. Biology tutor** for Senior High School students, **2003-2010**.

### Funding

#### Active

**F8. FEAST/MDP (Faculty Engineering Art Students/Multidisciplinary Design Program)**, University of Michigan:

"LuCelegans: The Interactive worm Nervous System",  
Role: **PI**, Amount: \$2,000

**1/1/2021-12/31/2021**

**F7. Claude D. Pepper Older Americans Independence Center (OAIC), University of Michigan Medical School, and University of Michigan Geriatrics Center;** Pilot Grant:

"Exploring the impact of neuronal vulnerability to aging-related disorders on spatial learning in *C. elegans* model organism",  
Role: **PI**, Amount: \$40,000

**7/1/2019-6/30/2021**

**F6. NIH-National Institutes of Health, K01 Career Development Award,** National Institute on Aging (**NIA**):

"Deciphering aging-driven cognitive decline in *C. elegans* spatial memory and learning through an interdisciplinary approach", K01 AG057833

Role: **PI**, Amount: \$566,000

**7/2018-6/2023**

### Completed

**F5. ArtsEngine, University of Michigan,** Interdisciplinary Faculty Research Grant Award:

"LuCelegans: Light-up 3-dimensional interactive prototype of *C. elegans* connectome",

Role: **PI**, Amount: \$3,000

**11/1/2019-12/31/2020**

**F4. University of Michigan Office of Research (UMOR)** Faculty Grants and Awards Program, Small Scale Project Grant:

"3D-printing Agar-Based Hydrogel for use in *C. elegans* Behavioral Assays",

Role: **PI**, Amount: \$27,000

**9/2018-4/2020**

**F3. Japan Agency for Medical Research and Development (AMED),** Interstellar Initiative Funding Award for further proposal development:

"Elucidation of aging-driven decline of cognitive and motor behaviors through an interdisciplinary approach",

Role: **co-PI**, (PI: Teppei Matsui, University of Tokyo School of Medicine; co-PI: Carlotta Mummolo, New Jersey Institute of Technology), Amount: \$21,000; share: \$7,000

**10/2019-3/2020**

**F2. University of Michigan Office of Research (UMOR)** Faculty Grants and Awards Program, Small Scale Project Grant:

"Organizing the 7<sup>th</sup> Annual Midwest *C. elegans* Meeting",

Role: **Collaborator**, PI: Scott Leiser, Molec. & Integr. Physiology, UoM Medical School  
Amount: \$5,000

**Spring 2019**

**F1. University of Michigan Office of Research (UMOR)** Faculty Grants and Awards Program, Small Scale Project Grant:

#U055203 "A novel way to individually label model organism *C. elegans* populations",

Role: **PI**, Amount: \$30,000

**1/2017-8/2018**

### Service

**External** (non UoM)

#### V5. Reviewer

i. **NSF-National Sciences Foundation, ad hoc,** Division of Integrative Organismal Systems (IOS), **2020**

ii. **Scientific journals** (*Publons record available*) **2018-today**

-Communications Biology-Nature Group (Biological Sciences)

-Journal of Visualized Experiments-JoVE (Biology, Physical Sciences)

- RSC Advances-Royal Society of Chemistry (Chemical Sciences & multidisciplinary areas)
- PLOS ONE (Interdisciplinary, Science and Medicine).

#### V4. Scientific Conferences & Meetings

##### A) Organizer

- i. **7<sup>th</sup> Midwest *C. elegans* meeting**, Ann Arbor, Michigan, **2019**. Co-organizers: Scott Leiser, UoM Medical School; Hannah Seidel, Eastern Michigan University (125 attendees from 22 institutions at 4 states, 8 corporate sponsors).

##### B) Session Chair/co-Chair

- i. **Genetics Society of America**, 22<sup>nd</sup> *C. elegans* International Meeting, Los Angeles, CA, **2019**.

##### C) Poster Judge

- v. **Genetics Society of America**, 22<sup>nd</sup> *C. elegans* International Meeting, Los Angeles, CA, **2019**.
- iv. **Midwest *C. elegans* meeting**, 6<sup>th</sup> Annual Meeting, Ypsilanti, Michigan, **2018**.
- iii. **University of Michigan**, UROP Symposium, Undergraduate Research Opportunity Program, **2018**.
- ii. **Genetics Society of America** 21<sup>st</sup> *C. elegans* International Meeting, Los Angeles, CA, **2017**.
- i. **Genetics Society of America**, 20<sup>th</sup> *C. elegans* International Meeting, Los Angeles, CA, **2015**.

##### D) Poster session organizing committee

- i. **Hellenic Society for Biological Sciences**, Annual Scientific Conference, Greece, **2005-2008**.

#### Internal (UoM)

**V3. University of Michigan Space Institute: Executive Committee, and Lead for Space Biology** (the only ME faculty serving on UMSI Exec Comm); **2019-today**.

**V2. College of Engineering non-evaluative representative**, research-track candidates (2), **2020**.

**V1. Mechanical Engineering Dept**, Host of two visitors for the Departmental Seminar Series:

- i. Eduardo Izquierdo, Assistant Professor, University of Indiana at Bloomington, **2018**.
- ii. Carlotta Mummolo, Assistant Professor, New Jersey Institute of Technology, **2020**.

#### Press

**X1. New York Academy of Sciences Newsletter:** Building Transformative Collaborations to Address Society's Challenges-Finding a Common Research Language and a New Approach to Studying Aging; [article](#) featuring EG and winning team mates, sharing their experience on forging international collaborations; **2020**

#### Outreach

**H4. High school students' lab supervision and mentoring:**

- i. Audrey Wu, Huron High School, Ann Arbor, MI; Familiarization with microscopy techniques and *C. elegans* biology, U-M Medical School, 3hr/week, **2019-today**.

**H3. 1<sup>st</sup> Generation Engineering Program**, faculty mentor, **2018-ongoing**.

**H2. Graduate Society of Women Engineers Female Faculty-Student Mixer**, faculty participant, **2018**.

**H1. Spring NanoCamp 2014:** lab presenter in K-12 outreach event, National Foundation of Science-funded National Nanotechnology Infrastructure Network, Lurie Nanofabrication Facility-University of Michigan, **2014**.

## Activities for the promotion of Diversity, Equity, and Inclusion

**Y1. Active recruiting** of people who are historically underrepresented in STEM: In total of 35 students (post-graduate, Master's, undergrads) directly recruited by EG, 20 (~57%) are members of underrepresented communities (people of color and the Latinx community, people self-identifying as women, 1<sup>st</sup> generation students or students from challenging socio-economic backgrounds). Efforts recognized by being awarded the 2021 **Willie Hobbs Moore Aspire, Advance and Achieve Award**.

**Y2. Intercultural Competency Workshop**, U-M Rackham School of Graduate Studies, designed for faculty affiliated with the Neuroscience Graduate program, **2021**.

## Other Activities and Skills

**A4. Science as Art-Competition, ArtsEngine-UM**, Faculty Panelist and Faculty Mentor/Judge, **2021**.

**A3. Worm Maze Behavior group**: Coordinator of monthly meetings of all students across campus (College of Engineering, Medical School, LSA) who work on the *C. elegans* spatial learning project, **2017-ongoing**.

**A2. Scientific Societies**: Genetics Society of America-GSA (member), Society for Neuroscience-SfN (member), New York Academy of Sciences-NYAS (professional member), Society for Integrative and Comparative Biology-SICB (member), Hellenic Society for Biological Sciences (member).

**A1. Languages**: Greek (native), English (fluent), French (very good command), Italian (good command), Spanish (good command).