RYAN MARC CARNEY

Associate Professor of Digital Science • National Geographic Explorer
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EDUCATION

PhD	2016	**Brown University**, Providence, RI Ecology & Evolutionary Biology; advisor Prof. Stephen Gatesy Thesis: *Evolution of the archosaurian shoulder joint and the flight stroke of Archaeopteryx*
MS	2013	Ecology & Evolutionary Biology
MPH	2010	**Yale School of Medicine**, New Haven, CT Epidemiology of Microbial Diseases; advisor Prof. Durland Fish Thesis: *GIS-based early warning system for predicting high-risk areas of dengue virus transmission, Ribeirão Preto, Brazil.* Winner of Dean's Prize for Outstanding Thesis.
MBA	2010	**Yale School of Management**, New Haven, CT Concentration: Technology
		University of California – Berkeley, Berkeley, CA
BA (Honors)	2003	Integrative Biology; advisor Prof. Kevin Padian Thesis: *Phylogenetically testing the hypothesis of secondary flightlessness within Maniraptoriformes*
BA	2003	Art Practice

ACADEMIC POSITION

2024 – present	**Associate Professor of Digital Science, University of South Florida**, Tampa, FL Department of Integrative Biology
2016 – 2024	**Assistant Professor of Digital Science, University of South Florida**, Tampa, FL Department of Integrative Biology

RESEARCH INTERESTS

From *Archaeopteryx* to Zika, I study dinosaurs and diseases by using interdisciplinary methodologies and developing cutting-edge digital technologies (see also *Patents* and *Software* sections below):

- **Dinosaurs.** My paleontology research focuses on the iconic ***Archaeopteryx*** and extant dinosaurs. Methodologies include 3D imaging, modeling, and computer animation – along with a joint surface analysis approach and **scientific motion transfer** – to investigate functional morphology and the evolution of motions such as the avian flight stroke. I also work in the **virtual reality and augmented reality** space, translating research into next-generation visualizations that bring dinosaurs "back to life" for outreach and pedagogy.
- **Diseases.** My epidemiology research focuses on the surveillance and control of **mosquito-borne diseases** such as malaria, dengue, West Nile virus, and Zika. Through grants from the **National Science Foundation** and **National Institutes of Health**, my team identifies disease-spreading and invasive mosquitoes using **artificial intelligence**, along with **citizen science** data from three partner apps: iNaturalist, Mosquito Alert, and NASA's GLOBE Observer. My research also leverages geographic information systems, remote sensing, and spatial modeling techniques like the DYCAST early warning system, to model vector habitats, detect disease hot spots, and enable the strategic targeting of mosquito control efforts.

SELECTED GRANTS AND AWARDS

2024 – 2027	National Institutes of Health	Co-I: Malaria Research in Africa**	$408,147
2022 – 2023	National Science Foundation	PI: Research Experiences for Undergraduates Grant	$16,000
2021 – 2022	National Science Foundation	PI: Research Experiences for Undergraduates Grant	$16,000
2020 – 2025	National Science Foundation	PI: AI for Mosquito-Borne Diseases*	$900,000
2020 – 2021	University of South Florida	Co-PI: COVID-19 Research Grant***	$25,000
2014	National Geographic Society	PI: Waitt Research Grant	$13,992
2013	National Geographic Society	PI: Committee for Research and Exploration Grant	$13,800
2012	National Geographic Society	PI: Waitt Research Grant	$14,971
2011	National Science Foundation	PI: Graduate Research Fellowship	$127,900
2009 – 2011	National Science Foundation	PI: SGER Research Grant	$41,996
2010	National Geographic Society	PI: Expeditions Council Research Grant	$5,745
2010	National Geographic Society	PI: Waitt Research Grant	$4,950
2008	Centers for Disease Control	PI: Graduate Training Fellowship	$7,000
2005	CA Dept of Public Health	PI: DYCAST West Nile Virus Risk Modeling System	$200,000

2024	Journal *Insects*	2022 Best Paper Award (Carney et al 2022)	$578
2023	University of South Florida	CAS Liberal Arts Teaching Award	$1,000
2021	University of South Florida	Outstanding Research Achievement Award	$2,000
2020	University of South Florida	Outstanding Undergraduate Teaching Award	$2,000
2018	University of South Florida	Outstanding Faculty Award	n/a
2017	National Geographic Society	Emerging Explorer Award	$10,000
2007 – 2010	Yale University	Dean's Scholarship, merit-based top 5% of students	$22,400
2007 – 2008	Yale University	Susan Dwight Bliss Scholarship	$5,000
1999 – 2003	UC Berkeley	Alumni Leadership Scholarship	$5,000
1997	Boy Scouts of America	Eagle Scout	n/a

GRANTS CURRENT

* **Principal Investigator** for **National Science Foundation** award #2014547, *Smart & Connected Health: Integrative*: Surveillance and Control of Mosquito-Borne Diseases through Automated Species Identification and Spatiotemporal Modeling. **$932,000** total; 2020-10-01 to 2024-09-30. The mosquito is the deadliest animal on the planet, responsible for >700 million infections and nearly 1 million deaths every year — primarily from malaria, with almost half a million deaths in children under the age of 5. Yet only 3% of mosquito species are known to transmit pathogens to humans, necessitating rapid and accurate identification, especially given the lack of vaccines and cures for mosquito-borne diseases. Our research involves development and deployment of **artificial intelligence** (AI) software for identifying disease-carrying species of mosquitoes in the adult and larval stages, leveraging multiple global **citizen science** platforms, and particularly targeting the invasive malaria vector, ***Anopheles stephensi***. Hardware development includes an AI-enabled smart trap for adult mosquito identification. Collaborators include the CDC, NASA, iNaturalist, Mosquito Alert, and U.S. Department of State. See *Patents*, *Publications*, *Press*, and *Software* below; in summary:

- **Research products**: eight peer-reviewed publications, two Research Experiences for Undergraduates grants, two Honors theses, one PhD dissertation, four patents pending, and three software products (mosquitodashboard.org, mosquitoID.org, DYCAST.org).
- **Research press**: featured on the homepages of NSF (2022) and USF (2020,2022,2023) and in 10 television segments including nationally on Good Morning America (video) and locally on ABC News (video).

** **National Institutes of Health** award, West-Central Africa EMERGENTS International Center of Excellence in Malaria Research (ICEMR). **$408,147** of $3.6M total; 2024-04-01 to 2029-03-31. Role: Co-I. PI: Rhoel Dinglasan, UF. Our USF team's primary responsibilities include software and hardware development and deployment, of our patent-pending **artificial intelligence**-enabled Anopheles StephenSI Smart Trap (ASSIST) for the targeted lure, capture, and identification of the deadly invasive malaria vector, ***Anopheles stephensi***. We also aim to detect and monitor this species by integrating our multi-platform **citizen science** infrastructure. Overall, the EMERGENTS program leverages successful, well-established collaborations, unique advanced research and training infrastructures, and an extensive Sub-Saharan Africa research network to address emerging and challenging issues in malaria transmission in the region. EMERGENTS is built on a proven research platform and consortium of World Bank-, African Academy of Sciences-, NIH/CDC-funded centers of excellence in Cameroon and Nigeria. Given that the necessary infrastructure, stakeholder engagement, and direct involvement in regional and continental-wide Malaria Elimination Programs are firmly established, the basic capacity building is built-in, allowing us to launch directly into advancing science. This assures implementation of rigorous and advanced approaches to tackling high-priority emerging and re-emerging issues in malaria that remain as significant impediments to achieving the 2030 SDGs for malaria, namely reducing malaria case incidence and related deaths by at least 90%.

GRANTS PENDING

National Science Foundation. *MRI: Track 2*: Acquisition of Next-Generation Computing Infrastructure to Scale Up Multidisciplinary Research in Artificial Intelligence at USF. Unfunded of $3.3M over three years. Role: Co-I.

GRANTS RECENT

*** **Co-Principal Investigator** for **USF COVID-19 Rapid Response Grant**: Spatial-Temporal Prediction Models for COVID-19. $25,000 total; 2020-08-26 to 2021-08-25. PI: Ming Ji, USF College of Nursing. Our research developed spatial-temporal prediction models of new daily cases and deaths from COVID-19 at the state and national level. The latter used point process-based count data models for disease outbreaks, and the strength of this model is that it incorporates the complex spatial correlations among different locations (counties/cities/census tracts) to improve temporal predictions. This allows predictions to be quickly estimated from limited data, which is extremely helpful at the early stage of disease outbreaks. Research products: 1). further development of Poisson spatial scan statistic cluster analysis (preliminary results: https://youtu.be/5KmDNDRLEWI), 2). STPMCOVID predictive model was published online to the United States COVID-19 Forecast Hub (https://github.com/reichlab/covid19-forecast-hub/tree/master/data-processed/USF-STPM)

TEACHING EXPERIENCE

University of South Florida, Tampa, FL 1/17 – present

Digital Dinosaurs (BSC 4454C/6932 lecture+laboratory course, 3 credits, 24 undergraduate/graduate students):

- Designed and developed technology-focused curriculum. Deliver lectures, supervise laboratory Teaching Assistant (TA), coordinate equipment, and work one-on-one with students for their Final Projects.
- **Synopsis:** This course provides a comprehensive exploration, including hands-on training, of cutting-edge hardware and software tools useful in the biological sciences. While the subject matter focuses on dinosaurs, techniques are applicable to a variety of STEAM disciplines, from biology and geology to art and architecture.
- Students gain both theoretical and practical knowledge across a variety of topics, such as digital scanning of "analog dinosaurs" (fossils), 3D reconstruction and analysis, visualization and animation technologies including virtual and augmented reality, and rapid prototyping methods such as 3D printing.
- "Real-world" exams evaluate students' synthesis of lecture concepts and lab skills through deliverables that represent the entire scientific pipeline in professional academia: idea/hypothesis generation, research, and

proposal writing (**Midterm**: a National Science Foundation pre-proposal), followed by data generation/ analysis, publication, and presentation (**Final Project**: digital and 3D-printed creatures: sketchfab.com/DigitalDinosaurs). Students are encouraged to submit this work to undergraduate grant opportunities.
- Resulting publications: Samuelson et al 2023, Gaboardi et al 2023, Cieri et al 2021; see *Publications*.
- Press: television coverage in 2019, 2018, and 2017; article in 2024

University of South Florida, Tampa, FL 1/19 – present
Comparative Vertebrate Anatomy (ZOO 3713C lecture+laboratory course, 4-5 credits, 96 undergraduate students):
- Lecture twice a week, and supervise 3-6 graduate TAs and 2-5 undergraduate TAs involved in the 4-8 4-hour laboratory sections primarily focused on dissections of the cat, shark, and salamander. Proctor four midterms.
- **Synopsis:** Designed for undergraduates in biology or the biomedical sciences — particularly pre-veterinary and pre-medicine students — this intensive course covers the anatomy of the vertebrates, emphasizing the comparative, functional, and evolutionary aspects of these animals. Topics include vertebrate evolution and diversity, histology, teeth, integument, and the various systems: skeletal, muscular, digestive, respiratory, circulatory, excretory, reproductive, and nervous.

University of South Florida, Tampa, FL 1/17 – present
- Other graduate courses: **Advances in Digital Biology** (BSC 6932), **Advances in Life Sciences** (BSC 6393), **Directed Research** (BSC 6910/7910), **Doctoral Dissertation** (BSC 7980), **Independent Study** (BSC 6905), **Master's Thesis** (BSC 6971)
- Other undergraduate courses: **Honors Thesis I** and **II** (IDH 4970), **Undergraduate Research** (BSC 4910)

Alpert Medical School, Brown University, Providence, RI 8/11 – 1/12
Graduate Teaching Instructor, **Human Anatomy** (BIOL 3664 IMS I)
- Taught cadaver-based laboratory sections for >100 medical students (>100 hours of laboratory).
- Designed rotator cuff prosection, dissected anatomy; presented knee and bovine heart/lung prosections.
- Wrote questions for written and practical examinations; proctored practical examinations.

School of Medicine, Yale University, New Haven, CT 9/09 – 12/09
Teaching Fellow, **GIS Applications in Epidemiology and Public Health** (Biostatistics 511; graduate level)
- Taught course lab sections using geographic information systems software; graded assignments.

Department of Art, University of California, Berkeley, CA 1/05 – 5/05
Teaching Assistant, **Digital Sculpture** (Art Practice 160; undergraduate level)
- Taught lab sections, lectured, and supervised and trained students to use 3D laser scanning equipment.

Invited course lectures
- "Digital Epidemiology" for graduate course at USF College of Public Health, 2020
- "Surveillance & Control of Mosquito-Borne Diseases" for graduate course at USF College of Public Health, 2019
- "Visualizing GIS in 3D and Augmented Reality" for graduate course at USF College of Public Health, 2017, 2018
- "Zika Early Warning System" for graduate course at USF College of Public Health, 2017
- "Archosaurs and *Archaeopteryx*" for undergraduate biology course at U Mass Dartmouth, 2016
- "Bird and Dinosaur Origins" for undergraduate biology course at Brown University, 2015
- "West Nile Virus Risk Modeling" for graduate public health course at Yale University, 2009
- "GIS and Public Health Surveillance" for graduate public health course at UC Berkeley, 2007

MENTORING & TRAINING

Postdoctoral Researchers

- *previously:* **Dr. Johnny Uelmen** (2022-23), immediate placement, currently tenure-track professor at University of Wisconsin; **Dr. Philip R. J. Morris** (2019-20); **Dr. Antonia Panaou** (2018), immediate placement as Engineer at the City of Lakeland Government.

Graduate Students

- **Sebastian Alvarez de Araya**. Masters student, Integrative Biology. Advisor for (2022-present)
- **Theron Kantelis**. PhD student, Integrative Biology. Advisor for (2021-present)
- **Alex Kirk**. PhD candidate, Integrative Biology. Advisor for (2017-present); expected graduation May 2024
- **Elise Samuelson**. PhD student, Integrative Biology. Advisor for (2021-present) [Samuelson et al 2023]
- **Farhat Binte Azam**. PhD candidate, Computer Science & Engineering. Co-Major Professor for (2023-present) [Azam et al 2023]
- *previously:* **Sarah Guzinski**. Masters in Integrative Biology. Advisor for (2021-23); **Tanvir Bhuiyan** PhD in Computer Science & Engineering. Co-Major Professor for (2022-23)

Graduate Committees

- **Colin Goodman**. PhD student, Integrative Biology (2022-present)
- **Jason Rodgers**. PhD student, Integrative Biology (2023-present)
- **Austin Smith**. PhD candidate, Integrative Biology (2021-present)
- *previously:* **Christian Brown** PhD Integrative Biology (2018-23); **Pablo Garcia** PhD Integrative Biology (2020-23) [Garcia et al 2023]; **Nils Tack** PhD Integrative Biology (2019-21); **Meredith Krause** PhD Integrative Biology (2019-20); **Pierre Couillaud** PhD Geosciences (2018); **Sean Beeman** PhD College of Public Health (2018-20)

Graduate Researchers

- **Jade Brunicardi**. USF Morsani College of Medicine. Mentor for Capstone Research (2021-present)
- *previously:* **Disha Jain** MPH College of Public Health (2020); **Yanti Leosari** MPH College of Public Health (2018-23) [Leosari et al 2023]; **William Gardner** MPH College of Public Health (2017-19)

Undergraduate Researchers

- **Karlene Rivera**. Honors College / Biomedical Sciences, Psychology; Honors Thesis Advisor (2021-present); **Damian Gonzalez**. Integrative Biology; Honors Thesis Committee member for (2022-present)
- *previously:* **Lyra Gaboardi**. Integrative Biology, (2022-23) [Gaboardi et al 2023]; **Elise Samuelson**. Integrative Biology, now PhD student (2021-22) [Samuelson et al 2023]; **Sebastian Alvarez de Araya**. Environmental Biology, Mathematics minor, now Masters student (2020-22); **Alexandra Newberg**. NSF REU researcher, primary supervisor Dr. Sarah Zohdy, CDC (2022); **Kaleb Smallwood**. Geosciences, Spanish minor (2020-22); **Israel Rivera-Molina**. Geosciences (2020-22); **Kristen Hodne**. Honors College / Biomedical Sciences, Public Health; Honors Thesis Advisee (2020-22); **Connor Mapes**. Honors College / Environmental Science & Policy, GIS minor (2018-21); Honors Thesis Advisee (2019-21) [Uelmen et al 2023a]; **Alec Baines**. Integrative Biology, Geosciences minor (2017-21); **Zia Coblentz**. Honors College / Anthropology; Honors Thesis Committee Member for (2020-21); **Mary Williams**. Honors College / Engineering (2017-20); **Ahmed Abd-Elrahman**. Computer Science & Engineering (2018-19); **Jim Mirzakhalov**. Honors College / Engineering (2017-18); **Kaleigh Nelson**. Integrative Biology, Geosciences (2017); **Manuel Regalado**. Honors College / Chemical Engineering (2017-18); **Michael Rey**. College of Public Health (2016-17); **Vincent Meijer**. Staff Research Associate (2017, 2021); **Myriam Van Walsum**. Staff Research Associate (2017)

Mentee Awards

- **Sarah Guzinski**: Hamed Mirzaei Foundation Travel Grant, $500 (2023); IB Department Travel Award, $800 (2023)
- **Jade Brunicardi**: Research, Innovation, & Scholarly Endeavors Award, $3,000 (2022)

- **Karlene Rivera** and **Sebastian Alvarez de Araya**: National Science Foundation Research Experiences for Undergraduates, $16,000 (2021), $16,000 (2022)
- **Alex Kirk**: Tharp Summer Fellowship, $12,221 total (2024, 2022); Institute for the Advanced Study of Culture and the Environment's Student Research in Paleontology, $1,000 (2019); Porter Family Award, $1,000 total (2017, 2019)
- **Alec Baines**: Tampa Bay Fossil Club Paleontology Scholarship, $500 (2019)
- **Manuel Regalado**: Fulbright UK Summer Institute Program, $8,500 (2018)

PUBLICATIONS

citations: **1,174** • h-index: **15** • Google Scholar profile: [link]

*undergraduate, **graduate, ***postdoc; directly mentored
IF = Impact Factor; Q = Quartile (SJR, scimagojr.com)

In revision

i). Diaz Jr. RE, Sues H, Anderson CV, **Carney RM**, Taylor-Diaz EA, Elsey R, Oberg K, Ben Nava P, Chuong C-M, Jiang J, Pham V, Alegre A, Weeks I, Nissen RM, Schachner E, Trainor P, Sedelmayr J, Davis M, Lamb J, Bonett R, Fisher RN, Rogers C, Wake M, Trueb L, Behringer R, Rasweiler IV JJ, Diogo R, Adesomo A, de Queiroz K, Burbrink F, Sanger T, Hanken J, & Maddin HC. A tectonic model for the origin of cranioskeletal diversity across vertebrates. ***Nature***
• IF = 64.8; **top journal** in Multidisciplinary; **Q1** in Multidisciplinary

ii). **Carney RM**. Topological coordinate systems: a joint surface approach for comparative skeletal analysis and scientific motion transfer. ***Journal of Experimental Biology***
• IF = 3.3; **top journal** in comparative animal physiology; **Q1** in Animal Science and Zoology; **Q1** in Medicine (misc)

iii). Low RD, Kohl H, Overoye D, Nelson PV, Schelkin L, Yang D, Huang X, Chellappan S, Azam FB, **Carney RM**, Falk M, Garriga J, Boger R, & Schwerin T. GLOBE OBSERVER: Advancing earth system knowledge with AI-powered citizen science. ***Citizen Science: Theory & Practice***
• IF = 4.5; **Q1** in Multidisciplinary

Published

39). Iyaloo DP, Zohdy S, **Carney RM**, Mosawa VR, Elahee KB, Munglee N, Latchooman N, Puryag S, Bheecarry A, Bhoobun H, Rasamoelina-Andriamanivo H, Bedja SA, Spear J, Ballet T, & Carter TE. In press. A regional One Health approach to the risk of invasion by *Anopheles stephensi* in Mauritius. ***PLOS Neglected Tropical Diseases***.
• IF = 4.8; **Q1** in Infectious Diseases; **Q1** in Public Health, Environmental and Occupational Health

38). Samuelson E*, Kirk AM**, Kaplan H, & **Carney RM**. 2023. Digital Dinosaurs: bringing dinosaurs back to life with VR/AR in the college classroom. Invited book chapter in *Ethical Considerations of Virtual Reality in the College Classroom: Cross-Disciplinary Case Studies of Immersive Technology Implementation*. Edited by Bowdon M, Yee K, & Dorner W. Published by Routledge. doi.org/10.4324/9781003329718-16 pdf

37). Garcia P**, Diaz RE Jr., Anderson CV, Andrianjafy TM, de Beer L, Edmonds DA, & **Carney RM**. 2023. Mosquito-bite induced color change in chameleon skin. ***Herpetological Review*** 54(3): 353-8.

36). Azam FB**, **Carney RM**, Kariev S, Nallan K, Subramanian M, Sampath G, Kumar A, & Chellappan S. 2023. Classifying stages in the gonotrophic cycle of mosquitoes from images using computer vision techniques. ***Scientific Reports*** 13:22130 doi.org/10.1038/s41598-023-47266-7
• IF = 4.6; **Q1** in Multidisciplinary

35). Uelmen JA***, Clark A, Palmer J, Kohler J, Van Dyke LC, Low R, Mapes C*, & **Carney RM**. 2023. Global Mosquito Observations Dashboard (GMOD): creating a user-friendly web interface fueled by citizen science to monitor invasive and vector mosquitoes. ***International Journal of Health Geographics*** doi.org/10.1186/s12942-023-00350-7
• IF = 5.3; **Q1** in Public Health, Environmental and Occupational Health; **Q1** in Computer Science (misc)
• Selected by journal for their collection, *Recent advances in geospatial techniques for monitoring and mitigating climate change effects on human health*

34). **Carney RM**, Long A, Low RD, Zohdy S, Palmer JRB, Elias P, Bartumeus F, Njoroge L, Muniafu M, Uelmen J***, Rahola N, & Chellappan S. 2023. Citizen science as an approach for responding to the threat of *Anopheles stephensi* in Africa. ***Citizen Science: Theory and Practice*** 8(1): 60: 1-15. doi.org/10.5334/cstp.616 pdf
• IF = 4.5; **Q1** in Multidisciplinary

33). Herbert GS, Hill SA, Pio MJ, **Carney RM**, Carlson A, Newham E, & Bright JA. 2023. Three-dimensional visualization of predatory gastropod feeding teeth with synchrotron scanning. ***Journal of Morphology*** 284, e21633. doi.org/10.1002/jmor.21633
• IF = 1.8; **Q1** in Animal Science and Zoology

32). Gaboardi LM*, Reeves LE, Morey GAM, Stanton DL, & **Carney RM**. 2023. A new species of the fish louse genus *Dipteropeltis* Calman, 1912 (Crustacea: Branchiura) from Peru. ***Zootaxa*** 5315 (2): 101–121 pdf/SI

31). Uelmen JA***, Mapes CD*, Prasauskas A, Boohene C, Burns L, Stuck J, & **Carney RM**. 2023. A habitat model for disease vector *Aedes aegypti* in the Tampa Bay Area, Florida. ***Journal of the American Mosquito Control Association*** 39(2): 96-107. doi.org/10.2987/22-7109 pdf/SI
• Study mentioned in media coverage, summer 2023 (see *Press* below)

30). Leosari Y**, Uelmen JA***, & **Carney RM**. 2023. Spatial evaluation of healthcare accessibility across archipelagic communities of Maluku Province, Indonesia. ***PLOS Global Public Health*** 3(3):e0001600 pdf + SI

29). **Carney RM**, Mapes C*, Low RD, Long A, Bowser A, Durieux D, Rivera K*, Dekramanjian B, Bartumeus F, Guerrero D, Seltzer CE, Azam F, Chellappan S, & Palmer JRB. 2022. Integrating global citizen science platforms to enable next-generation surveillance of invasive and vector mosquitoes. ***Insects*** 13(8):675 doi.org/10.3390/insects13080675 pdf + SI
• IF = 3.0; **Q1** in Insect Science
• **Winner of the journal's Best Paper Award (2022)**
• Journal's #1 "Most Viewed Paper, Last 12 months" (as of July 2023); Altmetric: 99th percentile
• Featured on the homepages of **NSF** (2022) and **USF** (2022,2023), and in seven television segments (see *Press* below)

28). Griffin CT, Botelho JF, Hanson M, Fabbri M, Smith-Paredes D, **Carney RM**, Norell MA, Egawa S, Gatesy SM, Rowe TB, Elsey RM, Nesbitt SJ, & Bhullar B-AS. 2022. The developing bird pelvis passes through ancestral dinosaurian conditions. ***Nature*** doi.org/10.1038/s41586-022-04982-w pdf + SI
• IF = 64.8; **top journal** in Multidisciplinary; **Q1** in Multidisciplinary
• Altmetric: 99th percentile (press release; see *Press* below)

27). Bhuiyan T**, **Carney RM**, & Chellappan S. 2022. Artificial intelligence versus natural selection: Using computer vision techniques to classify bees and bee mimics. ***iScience*** 25, 104924 doi.org/10.1016/j.isci.2022.104924 pdf + SI
• IF = 5.8; **Q1** in Multidisciplinary

26). Cieri RL, Turner ML, **Carney RM**, Falkingham PL, Kirk AM**, Wang T, Jensen B, Novotny J, Tveite J, Gatesy SM, Laidlaw DH, Kaplan H, Moorman AFM, Howell M, Engel B, Cruz C, Smith A, Gerichs W, Lian Y, Schultz JT, &

Farmer CG. 2021. Virtual and augmented reality: New tools for visualizing, analyzing, and communicating complex morphology. ***Journal of Morphology*** 282(12):1785-1800 doi.org/10.1002/jmor.21421 pdf + SI video
• IF = 1.8; **Q1** in Animal Science and Zoology

25). **Carney RM**, Tischlinger H, & Shawkey MD. 2020. Evidence corroborates identity of isolated fossil feather as a wing covert of *Archaeopteryx*. ***Scientific Reports*** 10:15593 pdf/SI
• IF = 4.6; **Q1** in Multidisciplinary
• Press: National Geographic, The New York Times, CGTN, USF; Altmetric: 99th percentile
• Selected by journal for their collection, *Editor's choice: Dinosaurs*

24). Minakshi M, Bharti P, McClinton III WB, Mirzakhalov J, **Carney RM**, & Chellappan S. 2020. Automating the surveillance of mosquito vectors from trapped specimens using computer vision techniques. ***Proceedings of ACM COMPASS***. p.105-115. doi.org/10.1145/3378393.3402260
• IF = 2.8; 20% acceptance rate

23). Schwarz D, Kundrát M, Tischlinger H, Dyke G, & **Carney RM**. 2019. Ultraviolet light illuminates the avian nature of the Berlin *Archaeopteryx* skeleton. ***Scientific Reports*** 9:6518
• IF = 4.6; **Q1** in Multidisciplinary

22). Baier DB, Garrity BM, Moritz S, & **Carney RM**. 2018. *Alligator mississippiensis* sternal and shoulder girdle mobility increase stride length during high walks. ***Journal of Experimental Biology*** *221*(22):jeb186791
• IF = 3.3; **top journal** in comparative animal physiology; **Q1** in Animal Science and Zoology; **Q1** in Medicine (misc)
• Selected by journal for their collection, *Comparative Biomechanics of Movement*

21). Leandro-Reguillo P, Panaou T, **Carney R**, & Jacob BG. 2017. Fuzzification of multi-criteria proxy geoclassifiable vegetation and landscape biosignature estimators to predict the potential invasion of *Aedes aegypti* in Barcelona, Spain. ***International Journal of Geographic Information System*** 4(2):1-19 pdf + SI video

20). **Carney RM**. 2016. Evolution of the archosaurian shoulder joint and the flight stroke of *Archaeopteryx*. PhD dissertation, ***Brown University***

19). Lindgren J, Sjövall P, **Carney RM**, Cincotta A, Uvdal P, Hutcheson SW, Gustafsson O, Lefèvre U, Escuillié F, Heimdal J, Engdahl A, Gren JA, Kear BP, Wakamatsu K, Yans J, & Godefroit P. 2015. Molecular composition and ultrastructure of Jurassic paravian feathers. ***Scientific Reports*** 5(1): 13520 pdf + SI
• Altmetric: 99th percentile

18). Lindgren J, Sjövall P, **Carney RM**, Uvdal P, Gren JA, Dyke G, Schultz BP, Shawkey MD, Barnes KR, & Polcyn MJ. 2014. Skin pigmentation provides evidence of convergent melanism in extinct marine reptiles. ***Nature*** 506(7489):484–8 pdf + SI
• IF = 64.8; **top journal** in Multidisciplinary; **Q1** in Multidisciplinary

17). **Carney RM**, Vinther J, Shawkey MD, D'Alba L, & Ackermann J. 2012. New evidence on the colour and nature of the isolated *Archaeopteryx* feather. ***Nature Communications*** 3:637 doi: 10.1038/ncomms1642
• IF = 16.6; **Q1** in Biochemistry, Genetics, and Molecular Biology (miscellaneous)
• featured in >140 articles from 30 countries, including the *The New York Times*; see *Press* pdf + video
• Altmetric: 99th percentile

16). Vinther J, Jell P, Kampouris G, **Carney RM**, Racicot RA, & Briggs DEG. 2012. The origin of multiplacophorans – convergent evolution in aculiferan molluscs. ***Palaeontology*** 55(5):1007–19 pdf + animation
• IF = 3.5; **Q1** in Paleontology

15). **Carney RM**, Ahearn SC, McConchie A, Glaser C, Jean C, Barker C, Park B, Padgett K, Parker E, Aquino E, & Kramer V. 2011. Early warning system for West Nile virus risk areas, California, USA. ***Emerging Infectious Diseases*** 17(8):1445-54 pdf
• IF = 11.8; **Q1** in Medicine: Epidemiology; **Q1** in Medicine: Infectious Diseases

14). **Carney RM**. 2010. GIS-based early warning system for predicting high-risk areas of dengue virus transmission, Ribeirão Preto, Brazil. Masters thesis, ***Yale University*** pdf
• winner of Dean's Prize for Outstanding Thesis

13). **Carney RM**, Ahearn SC, McConchie A, Glaser C, Jean C, Barker C, Park B, Padgett K, & Kramer V. 2008. Implementation of the spatiotemporal DYCAST risk modeling system to predict human West Nile virus cases in California, 2005. In: *5th International Conference on Geographical Information Systems (**ICGIS-2008**): Proceedings, July 2-5, 2008*. Demirci, A. (Ed.)., Fatih University Publications, Istanbul, Vol. 2:657-63.

12). **Carney RM**, Husted S, Jean C, Glaser C, & Kramer V. 2008. Efficacy of aerial spraying of mosquito adulticide in reducing incidence of West Nile virus in humans, Sacramento County, California, 2005. ***Emerging Infectious Diseases*** 14(5):747-54 pdf
• IF = 11.8; **Q1** in Medicine: Epidemiology; **Q1** in Medicine: Infectious Diseases

11). Crosbie SP, Koenig WD, Reisen WK, Kramer VL, Marcus L, **Carney RM**, Pandolfino E, Bolen GM, Crosbie LR, Bell DA, Ernest HB. 2008. Early impact of West Nile virus on the Yellow-billed Magpie (*Pica nuttalli*). ***The Auk*** 125(3):542-50.

10). Feiszli T, Husted S, Park B, Eldrige B, Fang Y, Reisen WK, Jean C, Cossen C, **Carney R**, Parker E, Erickson C, McQuarry A, Kramer V. 2008. Surveillance for mosquito-borne encephalitis virus activity in California, 2007. ***Proceedings and Papers of the MVCAC*** 76:108-23.

9). Scott T, Lee P-Y, Padgett K, **Carney R**, Husted S, Koenig W. 2008. The impact of West Nile virus on birds in California's hardwood rangelands. ***Proceedings of the Sixth Symposium on Oak Woodlands*** 151-63.

8). Padgett KA, Reisen WK, Kahl-Purcell N, Fang Y, Cahoon-Young B, **Carney R**, Anderson N, Zucca L, Woods L, Husted S, Kramer V. 2007. West Nile virus infection in tree squirrels (Rodentia: Sciuridae) in California, 2004-2005. ***American Journal of Tropical Medicine and Hygiene*** 76(5):810-3.
• IF = 3.7; **Q1** in Parasitology; **Q1** in Medicine (misc)

7). Feiszli T, Park B, Kramer V, Kjemtrup A, Eldridge B, Fang Y, Reisen WK, Baylis E, Jean C, Glover J, **Carney R**, Padgett K, Erickson C, Husted S. 2007. Surveillance for mosquito-borne encephalitis virus activity in California, 2006. ***Proceedings and Papers of the MVCAC*** 75:48-59.

6). Reisen WK, Barker CM, **Carney R**, Lothrop HD, Wheeler SS, Wilson JL, Madon MB, Takahashi R, Carroll B, Garcia S, Fang Y, Shafii M, Kahl N, Ashtari S, Kramer V, Glaser C, Jean C. 2006. Role of corvids in epidemiology of West Nile virus in southern California. ***Journal of Medical Entomology*** 43(2):356-67.
• IF = 2.4; **Q1** in Insect Science; **Q1** in Veterinary (misc)

5). Reisen WK, Fang Y, Lothrop HD, Martinez VM, Wilson J, O'Connor P, **Carney R**, Cahoon-Young B, Shafii M, Brault AC. 2006. Overwintering of West Nile virus in southern California. ***Journal of Medical Entomology*** 43(2):344-55.
• IF = 2.4; **Q1** in Insect Science; **Q1** in Veterinary (misc)

4). Padgett KA, Cahoon-Young B, **Carney R**, Woods L, Read D, Husted S, Kramer V. 2006. Field and laboratory evaluation of diagnostic assays for detecting West Nile virus in oropharyngeal swabs from California wild birds. ***Vector-Borne and Zoonotic Diseases*** 6(2):183-91.

3). Hom A, Bonilla D, Kjemtrup A, Kramer VL, Cahoon-Young B, Barker C, Marcus L, Glaser C, Baylis E, Jean C, Eldridge B, **Carney R**, Padgett K, Sun B, Reisen WK, Woods L, Glover J, Erickson C, Barclay C, Husted S. 2006. Surveillance for mosquito-borne encephalitis virus activity and human disease, including West Nile virus in California, 2005. ***Proceedings and Papers of the MVCAC*** 74:43-54.

2). Wheeler SS, **Carney R**, Carroll B, Wright S, Armijos V, Wilson J, Garcia S, Fang Y, Reisen WK. 2005. West Nile virus in wild birds: who lives and who dies? ***Proceedings and Papers of the MVCAC*** 73:32-7.

1). Hom A, Marcus L, Kramer VL, Cahoon B, Glaser C, Cossen C, Baylis E, Jean C, Tu EH, Eldridge BF, **Carney R**, Padgett K, Sun B, Reisen WK, Woods L, Husted S. 2005. Surveillance for mosquito-borne encephalitis virus activity and human disease, including West Nile virus in California, 2004. ***Proceedings and Papers of the MVCAC*** 73:66-77.

PATENTS PENDING

1). **Carney RM** & Chellappan S. SYSTEMS AND METHODS FOR CLASSIFYING MOSQUITO LARVAE BASED ON EXTRACTED MASKS OF ANATOMICAL COMPONENTS FROM IMAGES. US 63/140,505; PCT/US22/17089; USF 20A055. International patent application.

2). **Carney RM**. MULTIFUNCTIONAL MELANIN-BASED METALORGANIC MATERIAL. US 63/264,374; USF 21B148. Provisional patent application.

3). **Carney RM**. INTEGUMENTARY SYSTEM USING ARRAYS OF MOBILE HEXAGONAL SCALES. US 63/264,556; USF 21B147. Provisional patent application.

4). Chellappan S, Saddow SE, **Carney RM**, Wolfram BM, & Weston M. SMART MOSQUITO TRAP FOR MOSQUITO CLASSIFICATION. US 17/496,563; PCT/US2021/053995; USF 20B151US; USF 20B151WO. International patent application. animation

5). Chellappan S, Minakshi M, Bharti P, & **Carney RM**. SYSTEMS AND METHODS FOR CLASSIFYING MOSQUITOES BASED ON EXTRACTED MASKS OF ANATOMICAL COMPONENTS FROM IMAGES. US 17/462,809; USF 21A015US. Full patent application.

6). Chellappan S, Azam F, **Carney RM**, & Kariev S. METHODS AND TECHNIQUES TO CLASSIFY STAGES IN THE GONOTROPHIC CYCLE OF MOSQUITOES FROM IMAGES USING COMPUTER VISION TECHNIQUES. US 18/776,899. Full patent application.

SOFTWARE

1). **Global Mosquito Observations Dashboard (GMOD)**: interactive map dashboard for visualizing and downloading mosquito data from citizen science platforms iNaturalist, Mosquito Alert, and NASA / GLOBE Observer's Mosquito Habitat Mapper and Land Cover. (Carney et al 2022; Uelmen et al 2023). mosquitodashboard.org

2). **mosquitoID.org**: artificial intelligence tools for citizen scientists and mosquito control personnel to identify the species and gonotrophic stage of larval and adult mosquitoes using smartphone photos. Developed through NSF grant #2014547 and three patents pending, in collaboration with the Chellappan lab. (Carney et al 2022; Minakshi et al 2020a,b). mosquitoID.org (beta)

3). **DYCAST**: Dynamic Continuous-Area Space-Time model for predicting hot spots of virus transmission (e.g., West Nile virus, dengue, Zika). PI on software development projects; coding by Vincent Meijer and Alan McConchie (Python, PostGIS, SQL). (Carney et al 2011; Carney 2010; Theophilides et al 2006, 2003, 2008). Project page: DYCAST.org. DYCAST 3.0 and QGIS plugin published on GitHub (2021): https://github.com/CarneyLab

4). **Bee classifiers**: artificial intelligence algorithms for image recognition of bees and bee mimics. (Bhuiyan et al 2022). Zenodo: https://doi.org/10.5281/zenodo.6965250

5). **ARchaeopteryx holographica**. Augmented reality app for iOS, developed in collaboration with National Geographic. Interactive experience showcases my scientific 3D reconstruction of the skeletal anatomy, flight stroke, and feather color of *Archaeopteryx lithographica* (2018; see also Carney 2016, Cieri et al 2021, Samuelson et al in press). video

6). **ArcOSAUR**: ArcGIS Operations for Surface Analysis Using Rasters toolkit for ArcGIS software. (Carney RM. 2008. *Journal of Vertebrate Paleontology* 28(3S):61). poster

7). **Googlecology**: interactive corporate planning dashboard for executives to easily visualize, analyze, and compare internal data. Invented a new heuristic—"organizational phylogenetics"—that integrates frameworks and methodologies from ecology, evolutionary science, and sociology. Dashboard built using Improvise architecture. (2009; proprietary)

REVIEWER FOR

Graduate Women in Science National Fellowship Program, *International Journal of General Medicine*, NASA, *Nature*, *Naturwissenschaften*, *PLOS ONE*, SLAC National Accelerator Lab

PROFESSIONAL AFFILIATIONS

American Chemical Society, American Mosquito Control Association, Biodiversity Enhancement And Control Of Non-native Species (BEACONS), International Society of Vertebrate Morphology, Sigma Xi (Full Member, 2015-present), National Geographic (Explorer, 2012-present), Southeastern Center of Excellence in Vector-Borne Diseases (2022-present), Society of Experimental Biology, Society for Integrative & Comparative Biology, Society of Vertebrate Paleontology (Lanzendorf PaleoArt Committee, 2012–present), Tampa Bay Fossil Club (Scientific Advisor, 2018-present), USF Anthropocene Working Group, USF Evolution Working Group, USF Paleobiology Working Group, USF Pandemic Research Response Network™ COVID-19 Research Task Force (Member of two hubs: Surveillance & Epidemiology, and Information Computing & Communications Technologies, 2020-present)

INSTITUTIONAL SERVICE (USF)

- Department of Integrative Biology: Chair of Search Committee for Assistant Instructor position (2022-23), Curriculum Committee (2019-22), Co-Chair of Seminar Committee (2019-21), Visibility & Web Page

Committee (2017-19), Graduate Admission and Policy Committee (2017-19)
- University of South Florida: Office of Undergraduate Research, Faculty Advisory Committee (2017-18); Pre-Veterinary Society, Faculty Advisor (2018-present)

PROFESSIONAL EXPERIENCE

Paleontologist 8/02 – present
- Served as Principal Investigator for various international collaborative research projects, most notably: 1). high-resolution 3D digital scanning and reconstruction of the best-preserved *Archaeopteryx* skeleton, 2). investigating the color and composition of the isolated *Archaeopteryx* fossil feather (Carney et al 2012, 2020), and 3). investigating the coloration and exceptional soft-tissue preservation of a mummified dinosaur.
- Created a set of computational tools (ArcOSAUR: ArcGIS Operations for Surface Analysis Using Rasters) for topographical analysis of 3D anatomical data within a geographic information systems platform.
- Conducted fieldwork in the Cretaceous Hell Creek Formation of North Dakota and the Jurassic Solnhofen Plattenkalk of Germany.
- Produced and directed documentary video, photography, and press releases for future dissemination in popular media; created and licensed computer animated video content for publication and television broadcast.

Google, Mountain View, CA 6/09 – 8/09
Intern
- Created an interactive corporate planning dashboard ("Googlecology") for executives to easily visualize, analyze, and compare internal data. Invented a new heuristic—"organizational phylogenetics"—that integrates frameworks and methodologies from ecology, evolutionary science, and sociology.
- Validated and improved a survival analysis statistical model for predicting employee attrition. Created an Excel-based tool ("ROCnroll") for computing optimal hazard thresholds for classifying employees as high vs. low risk of attrition, using receiver operating characteristic analysis and validity measures.
- Created various indices for measuring team diversity; analyzed which elements of diversity drive innovation on engineering teams, and how collaboration modifies these effects.

Yale University, Ribeirão Preto, Brazil 6/08 – 8/08
Centers for Disease Control, Graduate Fellow Intern
- Designed and conducted a research project involving the spatiotemporal analysis of dengue virus transmission in Ribeirão Preto, Brazil; created and analyzed various datasets (e.g., human dengue cases, vector surveillance, census, address locator, satellite imagery) (Carney 2010).
- Met with local health departments, vector control agency, research laboratory, and medical facility to acquire necessary data; consulted agencies on how to implement and utilize geographic information systems.

California Department of Public Health, Richmond, CA 2/04 – 8/07
Coordinator, West Nile Virus (WNV) Dead Bird Surveillance Program
- Led a 33-person, $600K statewide disease surveillance program, including hotline and website.
- Served as Principal Investigator for two research projects (Carney et al 2008, Carney et al 2011), presented research at national and state conferences.
- Secured $200K to create and maintain an open-source, real-time West Nile virus risk modeling system (DYCAST), which predicted 82% of human cases its first year. Success resulted in incorporation into state response plan.
- Coordinated and collaborated with >250 agencies and laboratories regarding submission and reporting of test samples (>9K/year), weekly bulletins of statewide results, and public education campaigns.
- Developed and coordinated a centralized, multi-agency database network (BIRD) for managing and disseminating all avian influenza surveillance data statewide.

- Created hotline features to accommodate a 17-fold seasonal increase in calls (up to 3K/day) and increase public education and disease prevention; created and initiated novel algorithms and solutions for emergency control during epidemics.

University of California, Berkeley, CA 7/02 – 1/04
Staff Research Associate I & II, *Insect Biology: Dr. Robert Lane Lyme Disease Lab*

- Conducted research in NIH and CDC-funded genetic and BL3 animal laboratories; investigated the ecology, epidemiology, and microbiology of *Borrelia burgdorferi* spirochetes and other tick-borne pathogens.
- Conducted experimental studies and procedures involving research animals and vector-borne diseases in the field and laboratory; collected and managed ticks and wildlife in field-study sites.
- Performed PCR assays of ticks, vertebrate tissues, and borrelial isolates for identification and sequence characterization; managed data and sample collections.

SKILLS

Software: 3D modeling and animation (Maya, ZBrush), 3D processing (Geomagic, MeshLab), CT imaging and segmentation (Avizo/Amira, OsiriX/Horos), databases and queries (Access, Excel, SQL), data visualization (ImageJ, Improvise), genetic (GenBank, Sequencher), graphic design and illustration (Adobe Creative Suite), geographic information systems (ArcGIS suite/Python), MATLAB, MS Office suite, photogrammetry (PhotoScan, Reality Capture), satellite imaging (ER Mapper, ENVI), statistical (R, SAS, SPSS), video editing (Final Cut Pro, Premiere), web design/HTML.

Laboratory: acid demineralization, animal care, contrast-enhanced staining, CT scanning, DNA extraction/sequencing, electromyography, gel electrophoresis, human and animal cadaver dissection, laser scanning, light microscopy, RT-PCR, scanning electron microscopy, tissue fixation, time-of-flight secondary ion mass spectrometry (ToF-SIMS), veterinary surgery, wavelength-dispersive X-ray spectroscopy, X-ray diffraction, X-ray Reconstruction of Moving Morphology (XROMM).

SCIENCE OUTREACH

Books

- National Geographic Learning. Global middle school curriculum, *Impact*: Flying High. Featured Explorer and contributor (2024, 2016).
- **National Geographic Learning. Research and art profiled in high school textbook *World of Chemistry*, 4th Edition by Zumdahl et al 2020, p.380-1 (circulation >20K). Amazon, Cengage**
- National Geographic Learning. Research and art profiled in Explorations booklet "*Ryan Carney: Bringing Dinosaurs to Life*" (circulation >50K) (2020).
- *Archaeopteryx* research featured in *My Beloved Brontosaurus* by Riley Black
- *Archaeopteryx* research featured in *Zombie Birds, Astronaut Fish, and Other Weird Animals* by Becky Crew

Magazines

- *Science & Vie*. *Archaeopteryx* research featured in February 2024 issue: "Quand les fossiles trompent: récits de reclassifications surprenantes" by Romain Fouchard. (circulation 281K). link
- *National Geographic Magazine*. *Archaeopteryx* research featured in September 2021 issue: "From a dino's wing" by Michael Greshko. (circulation >10M)
- *New Scientist*. "The Early Bird" by Michael Marshall. (circulation 125K) (2019). link

- ***National Geographic Magazine. Archaeopteryx* research featured as 2-page spread in May 2018 issue (circulation >10M): image, article**
- *USF Magazine*. "Using virtual reality to learn more about dinosaurs" (2017). link
- *National Geographic Kids*. Research featured in "Dinosaur Color" by Zac Petit. (circulation >4M) (2014)

Miscellaneous
- **Make-A-Wish. My lab hosted Sebastian, a 7-year-old who is battling brain cancer and wished to be a paleontologist in a lab for a day. We also created a personalized lab coat and a 3D-printed "Sebastianosaurus" skull for him. The experience was featured on four local TV stations as well as Good Morning America (2020): https://bit.ly/3m43XY5 + https://gma.abc/3Zs90zV**
- National Geographic: one of five paleontologists on a "Reimagining Dinosaurs" panel on Facebook Live. Viewership: >140K. (2020)
- National Geographic Learning: two virtual "Masterclass" visits to elementary, middle, and high school students in 96 institutions across 12 countries in Latin America. Viewership: 11K. (2020)
- **National Geographic Explorer (2012-present); received Emerging Explorer Award which recognizes "uniquely gifted and inspiring scientists, conservationists, storytellers and innovators who are changing the world." (2017)**
- Visited 2nd grade classroom at Oakridge Elementary to teach students about dinosaurs and AR (2017): video
- Volunteer: Florida Aquarium: National Fossil Day (2016); Yale Peabody Museum: Dr. Martin Luther King Jr. Days, Paleo-Knowledge Bowl (2007–2010); California State Capital: Science Days (2007).

Museum Exhibits
- Pokémon Fossil Museum. Consultant (2021). link, virtual tour
- "Dinosaurs Take Flight: The Art of *Archaeopteryx*" traveling exhibit. Contributor, consultant (2015)
- Garden of the Gods Visitor Center. "*Theiophytalia kerri*." Consultant (2014)
- Lawrence Hall of Science. "Big Dinos Return." Contributor (2005)

Television
- Interviewed about MosquitoDashboard.org and mosquito AI research by Good Morning America, ABC Action News, FOX 13, Bay News 9, SNNTV, and WTSP in 2023, 2020
- WFLA (2022): "Meet the dinosaurs from 'Jurassic World Dominion'": video
- **FOX 13, Bay News 9. *Digital Dinosaurs* course and paleontology research featured in 2019, 2018, and 2017**
- National Geographic Channel. "*T. rex* Autopsy." Consultant (2015)
- Discovery / Science Channel. "The Dinosaur Feather Mystery." Contributor (2004)

PRESS

2024
- USF Press Release: "USF using AI to help combat malaria in Africa" by Cassidy Delamarter.
- FOX 13 (Tampa, FL). "AI-powered smart mosquito trap developed at USF to help fight spread of malaria, save lives abroad" by Briona Arradondo.
- Bay News 9 (Tampa, FL). "USF researchers develop mosquito "smart trap"to help fight malaria" by Cait McVey.
- ABC Action News (Tampa, FL). "USF researchers use artificial intelligence to combat malaria in Africa" by Julie Salmone.
- USF College of Arts & Sciences article: "Students connect to the past using present-day digital tools in 'Digital Dinosaurs' class" by Anna Mayor.
- The Wilson Center (Washington, DC). "*Anopheles stephensi* mosquitoes: an old problem, a new threat to malaria mitigation" by Ritika Sinha-Chaudhuri & Alison Parker.

2023

Globally, my mosquito AI research was covered by >50 news outlets, including:

- **Good Morning America segment and ABC News article (national): "How scientists are tracking mosquitoes that could be carrying deadly diseases" by Julia Jacobo, Daniel Manzo, and Ginger Zee.**
- ABC Action News segment and article (Tampa, FL). "USF researchers ask for public's help to track mosquito population in Tampa Bay" by Julie Salomone.
- EFE / Infobae (international, in Spanish). "An interactive "world map" of mosquitoes to help fight malaria" by Lorenzo Castro.
- USF News. "Mosquito watch: USF researchers urge use of global dashboard in light of recent malaria cases" by Cassidy Delamarter. Top story on the USF homepage June-July.
- FOX 13 (Tampa, FL). "USF scientists introduce mosquito tracking dashboard to help keep tabs on insects in Tampa Bay area" by Briona Arradondo.
- Spectrum Bay News 9 (Tampa, FL; Orlando, FL; Green Bay, WI). "USF scientists say smartphones can aid in mosquito research amid rise in local malaria cases" by Cait McVey.
- WTSP (Tampa, FL). "USF's global mosquito dashboard maps deadly species and malaria cases" by Adaure Achumba.
- SNNTV (Sarasota, FL). "Researchers develop new tool against malaria" by Sydney Roll.
- ABC 7 (Sarasota, FL). "USF researchers urge use of global dashboard in light of recent malaria cases".
- KHQ-TV (Spokane, WA). "Citizen scientists encouraged to help track mosquitos with new interactive dashboard from team at USF" by Amanda Smith.

2022

- **Carney et al 2022**: Global Mosquito Observations Dashboard (mosquitodashboard.org) and *Insects* study, "Integrating global citizen science platforms to enable next-generation surveillance of invasive and vector mosquitoes" • USF Press Release: "USF researchers launch global dashboard to track invasive mosquitoes carrying deadly diseases" (featured on the homepage) • select articles: NSF (featured on the homepage), NASA, Phys.org (1,2), SINC • Altmetric: 99th percentile.
- **Griffin et al 2022**: *Nature* study, "The developing bird pelvis passes through ancestral dinosaurian conditions" • Yale Press Release • select articles: Phys.org, Inverse • Altmetric: 99th percentile.

2021

- USF Press Release: "22 USF Faculty Members Recognized with Outstanding Research Achievements Awards"
- Tampa Channel 10: "This app is trying to track which mosquitoes in your area may be carrying diseases"
- USF Press Release: "USF researchers launch social media campaign to identify risk of mosquito-borne diseases in Tampa Bay"

2020

- **Carney et al 2020**, *Archaeopteryx* feather study, selected press: New York Times, National Geographic, USF
- USF Press Release: "USF researchers develop new technologies to fight mosquito-borne diseases"
- TV interview: WTSP. "USF awarded major grant to help control spread of mosquito-borne diseases"
- Comments in: https://www.nationalgeographic.com/science/2020/08/smallest-dinosaur-known-actually-peculiar-ancient-lizard/

2019

- Comment in: https://www.nationalgeographic.com/science/2019/06/first-blue-feathers-found-on-fossil-bird-messel-pit-rollers-paleontology/, https://www.nationalgeographic.com/science/article/smallest-ever-fossil-dinosaur-found-trapped-in-amber

2018

- Bay News 9: "USF professor brings dinosaurs 'back to life'" by Katie Jones:

http://www.baynews9.com/fl/tampa/news/2018/05/10/usf-professor-brings-dinosaurs-back-to-life.html
- Comment in: https://www.nationalgeographic.com/science/2018/10/news-fossil-lungs-bird-dinosaurs-cretaceous-soft-tissue-paleontology/

2017
- USF News. "USF scientist one of 14 world-changers named 2017 National Geographic Emerging Explorers" by Tina Meketa.
- National Geographic. "National Geographic Emerging Explorer Ryan Carney using X-rays and alligators to bring dinosaurs back to life" by Andrew Howley.
- Inside Higher Ed. "More than just cool?" by Nick Roll.
- The Science Times. "Paleontologist uses virtual reality to learn about the evolution of dinosaurs" by Zen Menahem.
- National Geographic. "Fourteen world-changers named 2017 National Geographic Emerging Explorers."
- Comment in: National Geographic. "How mosquitoes use stealth to steal your blood" by Elaina Zachos.

2016
- PNAS. "News Feature: Prehistoric animals, in living color" by Amber Dance.
- Comment in: Christian Science Monitor. "How a 10-million-year-old snake helps bring extinct animals into full color" by Eva Botkin-Kowacki.

2015
- **Lindgren et al 2015,** ***Scientific Reports*** press releases: EurekAlert!, Brown University: "Pigments, organelles persist in fossil feathers" • articles: Forbes, IFLScience!, NBC News, redOrbit, Science Update radio / AAAS, Tech Times, Vice / Motherboard, Der Standard (Austria), Yahoo! News (Canada), Gazeta Wyborcza (Poland), VladTime (Russia), Europa Press (Spain)
- Providence Journal. "'Nerd Nite' debut in Providence draws a curious crowd" by Carol Kozma
- Vice / Motherboard. "These Are the Dinosaurs Paleontologists Want to See in Movies" by Becky Ferreira

2014
- **Lindgren et al 2014,** ***Nature*** press release: EurekAlert!: "Fossil pigments reveal the colors of ancient sea monsters" • articles: BBC, Brown Daily Herald, Brown University, CBS News,Discovery News, National Geographic, Phys.org, redOrbit, Science / AAAS, The Scientist, Laborwelt (Germany), Spiegel Online (Germany), Le Scienze (Italy)
- Nature. "Rival species recast significance of 'first bird'" by Ewen Callaway
- National Geographic. "Feathered Fossils Give Scaly Dinosaurs a Makeover" by Dan Vergano
- **Carney et al 2014,** ***JVP*** press release: Society for Vertebrate Paleontology: "Taking a deeper look at 'ancient wing'" • articles: Vice / Motherboard, Science World Report, Science 2.0., Biosphere
- LiveScience. "True Color of Dinosaur Feathers Debated" by Megan Gannon
- COSMOS (Australia). "The ever-changing land of the dinosaurs" by Becky Crew
- Journal Sentinel. "Study finds new shades in proto-bird's feathers" by Jennifer Laaser
- Chemistry World / Royal Society of Chemistry (UK). "Colouring in the dinosaur book" by Emma Stoye

2012
- **Carney et al 2012,** ***Nature Communications***
  press releases: EurekAlert!, Brown University: "Winged dinosaur Archaeopteryx dressed for flight" • articles: The New York Times, Nature, Science / AAAS, National Geographic, Brown Daily Herald, ScienceNews, Huffington Post, Medill Reports, WSU, COSMOS (Australia), Die Presse (Austria), Futura-Sciences(France), Hindustan Times (India), NRC (Netherlands), NWT Magazine (Netherlands), Scientias (Netherlands), Kennislink (Netherlands), La Razon (Spain), metrics • **video**: National Geographic/Brown University, • radio: National Geographic Weekend Radio,

- Discover Magazine. "*Archaeopteryx*: The Embargoed Tattoo" by Carl Zimmer, The Loom blog.
- **Vinther et al 2012, *Palaeontology*** press release: UT Austin: "CT scan and 3-D print help scientists reconstruct an ancient mollusk" • articles: National Geographic, Daily Mail, Phys.org, redOrbit, Sci-News, Science, Space & Robots • animation: link

2011

- **Carney et al 2011, *Emerging Infectious Diseases*** press release: Brown University: "Software predicted virus risk in California epidemic" by David Orenstein • articles: Medical Xpress, redOrbit, UPI

2008

- **Carney et al 2008, *Emerging Infectious Diseases*** • article: Yale University. "Aerial Spraying Effectively Reduces Incidence of West Nile Virus in Humans" by Michael Greenwood

2006

- San Francisco Chronicle. "West Nile warning system: Citizens' dead bird reports have helped control infected mosquitoes" by Sabin Russell
- San Francisco Chronicle. "West Nile could get worse, expert warns: Virus outbreak could turn into major epidemic" by Sabin Russell
- Smash Magazine. "Mastema" by Lauren Napier
- Government Health IT. "Surveillance case study: Mosquito coasts" by Dibya Sarkar

2005

- San Francisco Chronicle. "Chronicles in Education: The New Science of Dinosaurs." Contributor.

ORAL PRESENTATIONS

- "New digital tools for fighting mosquito-borne diseases" Invited speaker for the Mosquito BEACONS: Biodiversity Enhancement And Control Of Non-native Species meeting hosted by the University of Florida. 02/14/2024.
- "Making an *Impact* in and out of the classroom: the journey of a National Geographic Explorer". National Geographic Learning virtual presentation to ESL educators in Latin America. 11/16/2023.
- "Digital dinosaurs & diseases: from *Archaeopteryx* to Zika". Tenure presentation. Department of Integrative Biology, University of South Florida. 09/07/2023.
- "Global Mosquito Observations Dashboard (GMOD): integrating citizen science platforms to enable next-generation surveillance of invasive and vector mosquitoes." American Mosquito Control Association annual conference. Reno, NV. 03/02/2023.
- "Leveraging citizen science & AI for the surveillance of invasive mosquito vectors." Invited speaker for the One Health PACT meeting hosted by the University of Leiden, Netherlands. 11/10/2022.
- "Leveraging citizen science & AI for the surveillance of invasive mosquito vectors." Invited speaker for the Mosquito BEACONS: Biodiversity Enhancement And Control Of Non-native Species meeting hosted by the University of Florida. 10/03/2022.
- "Artificial intelligence-enabled surveillance for *Anopheles stephensi*." Invited speaker for the SEGA One Health workshop, *Risk of vector-borne diseases, climate change and health impacts*. Hosted by the Mauritius Ministry of Health and Wellness. 6/22/2022.
- "Developing and deploying artificial intelligence techniques for the citizen science surveillance of *Anopheles stephensi* in Africa." Invited speaker for the World Malaria Day Symposium hosted by Johns Hopkins University. 4/25/2022.

- "AI-enabled citizen surveillance for invasive and vector mosquitoes." One of nine invited featured speakers for the workshop, *Citizen Science & Digital Entomology in Mosquito-Borne Disease Surveillance in Europe*. 3/23/2022. [video]
- "AI-enabled citizen surveillance for *Anopheles stephensi*." Invited featured speaker for the Innovative Vector Control Consortium's *Tech Bites* series. 2/18/2022.
- "Origins." Invited featured speaker for outreach webinar to high school students at Centro Escolar del Tepeyac in Naucalpan, Mexico. 6/11/2021.
- "New digital tools for fighting mosquito-borne diseases." Invited featured speaker for NASA's *GLOBE Mission Mosquito* webinar series. 5/13/2021. [video]
- "Digital Dinosaurs & Diseases." Invited featured speaker for the *Frontiers in Science* public lecture series. Florida Atlantic University. Boca Raton, FL. 2/21/2020.
- "Immersive Experience." Invited by USF to represent the College of Arts & Sciences and present my lab's digital paleontology and epidemiology research, via PowerPoint and hands-on demos. Synapse Summit. Tampa, FL. 2/11/2020.
- "*Archaeopteryx holographica*: Bringing the Urvogel back to life with scientific animation and VR/AR." Invited symposium speaker. Also co-led lab's station at the associated VIRTMorph symposium workshop. International Congress of Vertebrate Morphology conference. Prague, Czech Republic. 7/23/2019.
- "Evolution of the archosaurian shoulder joint and the flight stroke of *Archaeopteryx*". Invited talk to the USF Pre-Veterinary Society. Tampa, FL. 04/17/2019.
- "Evolution of the archosaurian shoulder joint and the flight stroke of *Archaeopteryx*". Society for Integrative & Comparative Biology annual conference. Tampa, FL. 01/05/2019.
- "*Archaeopteryx holographica*: bringing the Urvogel back to life with scientific animation and VR/AR." Invited symposium speaker. Society of Vertebrate Paleontology annual conference. Albuquerque, NM. 10/19/2018
- "Digital Dinosaurs & Diseases: from *Archaeopteryx* to Zika." Invited speaker. Biology Department Seminar, Southeastern Louisiana University. Hammond, LA. 9/6/2018.
- "Bringing dinosaurs back to life." Invited speaker. Student matinees and VR/AR demonstrations. Virginia Living Museum. Newport News, VA. 5/19/2018.
- "Digital Dinosaurs." Invited speaker. Evening presentation and VR/AR demonstration. Virginia Living Museum. Newport News, VA. 5/17/2018.
- "Digital Dinosaurs & Diseases: from *Archaeopteryx* to Zika." Invited speaker. Taste of Science. Tampa, FL. 4/26/2018.
- "Origins." Invited speaker. Student matinee (6th-8th graders). National Geographic Headquarters. Washington, DC. 4/20/2018.
- "On the unexpected origin of flight." Invited speaker. National Geographic Nights evening presentation. National Geographic Headquarters. Washington, DC. 4/19/2018.
- "On the origin of flight: the ascent of maniraptora." Invited speaker. Darwin Day event hosted by the Evolution Working Group and Institute for the Advanced Study of Culture and the Environment (IASCE), University of South Florida, Tampa, FL. 2018.
- "Digital dinosaurs & diseases." Invited speaker. SuperFAM TechTalk hosted by the Office of the Provost & Executive Vice President. University of South Florida, Tampa, FL. 2017.
- "Digital Dinosaurs & Diseases: from *Archaeopteryx* to Zika." Invited keynote speaker. Undergraduate Research Conference. University of South Florida, Tampa, FL. 2017.
- "Digital Dinosaurs." Invited speaker. Tampa Bay Fossil Club. Tampa, FL. 2017.
- "Digital Dinosaurs & Diseases: from *Archaeopteryx* to Zika." Invited speaker. Dean's Advisory Council. University of South Florida, Tampa, FL. 2017.
- "Digital Science: from *Archaeopteryx* to Zika." Invited speaker. Emerging Explorer award presentation. National Geographic Society Explorers Festival. National Geographic Headquarters. Washington, DC. 2017. [video]
- "*Archaeopteryx* and the evolution of flying dinosaurs." Invited keynote speaker. John H. Ostrom Symposium Series. Yale University, New Haven, CT. 2017.

- "Evolution of the archosaurian shoulder joint and the flight stroke of *Archaeopteryx*." Invited symposium speaker. Society of Vertebrate Paleontology conference, Salt Lake City, UT, 2016.
- "Swinging for the fences." Keynote speaker. Administrators Conference on Education, Albuquerque, NM, 2016.
- "A novel joint surface approach for studying skeletal evolution and motion." International Congress of Vertebrate Morphology, Washington, DC, 2016.
- "Diseases & Dinosaurs." Invited speaker. National Geographic Closer Look presentation. National Geographic Headquarters. Washington, DC, 2016.
- "Evolution of the archosaurian shoulder joint and the flight stroke of *Archaeopteryx*." PhD dissertation defense. Brown University, Providence RI, 2016.
- "The 3D *Archaeopteryx* Project." Society for Integrative and Comparative Biology, Division of Vertebrate Morphology regional meeting, University of Massachusetts Dartmouth, North Dartmouth, MA, 2015.
- "Imagining the Prehistoric." Invited speaker. Nerd Nite, Providence, RI, 2015.
- "*Archaeopteryx* in 4D." Invited symposium speaker. Society of Vertebrate Paleontology conference, Berlin, 2014.
- "Imagining the Prehistoric." Science Communication Research Social, Brown University, 2014.
- "Imagining the Prehistoric." Invited symposium speaker. National Geographic Society Explorers Symposium. National Geographic Headquarters. Washington, D.C., 2014.
- "*Archaeopteryx* and the evolution of the archosaur shoulder." Society for Integrative and Comparative Biology, Division of Vertebrate Morphology regional meeting, Yale University, New Haven, CT, 2013.
- "Back in black: new evidence on the color and nature of the isolated *Archaeopteryx* feather." International Congress of Vertebrate Morphology, Barcelona, Spain, 2013.
- "Back in black: new evidence on the color and nature of the isolated *Archaeopteryx* feather." Society for Experimental Biology annual conference, Valencia, Spain, 2013.
- "*Archaeopteryx* feather color and mummified dinosaur skin." Invited speaker. Geology Department, Brown University, Providence, RI, 2013.
- "A biologically-based GIS model for predicting outbreaks of mosquito-borne viral diseases." Society for Integrative and Comparative Biology Annual Meeting, San Francisco, CA, 2013.
- "Back in black: new evidence on the color, ultrastructure, and nature of the isolated *Archaeopteryx* fossil feather." University of Rhode Island Graduate Student Conference, Kingston, RI, 2012.
- "Back in black: new evidence on the color, ultrastructure, and nature of the isolated *Archaeopteryx* fossil feather." Invited speaker. Brown University public forum, Providence, RI, 2012.
- "Back in black: new evidence on the color, ultrastructure, and nature of the isolated *Archaeopteryx* fossil feather." Society for Integrative and Comparative Biology annual meeting, Charleston, SC, 2012.
- "Of bugs and birds: from vector-borne disease models to the color of flying dinosaur *Archaeopteryx*." Invited speaker. BioMed Interdisciplinary Graduate Seminar Series, Brown University, Providence, RI, 2011.
- "Black feather color in *Archaeopteryx*." Society of Vertebrate Paleontology conference, Las Vegas, NV, 2011.
- "Of bugs and birds: from ecological disease models to the color of *Archaeopteryx*." Ecology & Evolutionary Biology departmental seminar, Brown University, Providence, RI, 2011.
- "What I did on my summer vacation at Google / 'Search and Employ.'" Google, Mountain View, CA, 2009.
- "GooglEcology and ROCnroll." Google, Mountain View, CA. 2009.
- "Cretaceous Park." Google, Mountain View, CA, 2009.
- "Dengue transmission in Ribeirão Preto." Universidade de São Paulo; public health internship presentation, Ribeirão Preto, Brazil, 2008.
- "The 2006 California DYCAST Program." Mosquito & Vector Control Association of California (MVCAC) annual conference, Fresno, CA, 2007.
- "The California Dynamic Continuous-Area Space-Time (DYCAST) risk modeling system." Invited speaker. New York City Department of Health & Mental Hygiene, New York, NY, 2006.
- "Utilizing the spatiotemporal DYCAST system to predict human West Nile virus cases in California, and to evaluate the efficacy of aerial adulticiding within Sacramento County, 2005." Invited presentation to Centers for Disease Control and Prevention, via conference call, 2006.

- "The California Dynamic Continuous-Area Space-Time (DYCAST) risk modeling system." Microbial Diseases Laboratory, California Department of Public Health, Richmond, CA, 2006.
- "The California Dynamic Continuous-Area Space-Time (DYCAST) risk modeling system." Mosquito & Vector Control Association of California annual conference, Reno, NV, 2006.
- "The California Dynamic Continuous-Area Space-Time (DYCAST) risk modeling system." Mosquito & Vector Control Association of California continuing education workshop, Alameda, CA, 2006.
- "Utilizing dead bird reports and GIS: Prospective space time analysis of West Nile virus risk areas." ESRI Sacramento Users Group meeting, California Department of Public Health, Sacramento, CA, 2006.
- "California DYCAST Model: Prospective Space Time Analysis of West Nile Virus Risk Areas." California Conference of Local Health Officers, Oakland, CA, 2005.
- "Arbovirus Surveillance & Response: West Nile Virus: 2004." Vector-Borne Disease Section annual off-site meeting, Sacramento-Yolo Mosquito and Vector Control District, Elk Grove, CA, 2005.
- "Public Health Labs and the WNV Dead Bird Surveillance Program." Public Health Laboratory Dead Bird PCR Testing workshop, University of California, Davis, CA, 2005.
- "The WNV Dead Bird Surveillance Program." MVCAC continuing education workshop, Fresno, CA, 2005.
- "The Dead Bird Surveillance Program – Challenges and Solutions in 2004." Mosquito & Vector Control Association of California annual conference, Monterey, CA, 2005.
- "Utilizing digital techniques within an extant phylogenetic bracketing paradigm to reconstruct and analyze the role of articular cartilaginous structures in dromaeosaur forelimb function." Society of Vertebrate Paleontology annual conference, Denver, CO, 2004.
- "The CDHS West Nile virus Dead Bird Surveillance Program." Mosquito & Vector Control Association of California annual steering committee meeting, Davis, CA, 2004.
- "Using digital scanning and modeling to reconstruct and test the forelimb function of *Deinonychus antirrhopus*." Society of Vertebrate Paleontology annual conference, Minneapolis, MN, 2003.

ADDITIONAL INFORMATION

- Award-winning visual artist: drawing, painting, sculpture, and digital media. 3D digital reconstruction of *Archaeopteryx* published in *National Geographic Magazine* (May 2018) as a two-page spread with a circulation of ~10 million. [tinyurl.com/archyngm]

- Musician (2000-7); singer/songwriter, guitarist. Toured for three summers on Warped Tour, created and managed the DIY Stage for two. Opened up for the Misfits' 25th anniversary show, performed at the legendary punk venue 924 Gilman Street, and played live on San Francisco's largest rock radio station 107.7 The Bone. Recorded with Grammy-award winning producer/engineer Michael Rosen at Fantasy Studios, including a song and music video for Google. [ryancarney.com/music] [Spotify]

- Actor (1999-2006); Marla Dell Talent Agency. Appeared in *E.T. the Extra-Terrestrial 20th Anniversary Edition* (2002).