Fritz Alexander Francisco

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Born on January 07, 1989 in Macomb, Illinois, USA
US/German Citizen

Education

2025 – *present*	**Dean's Postdoctoral Research Fellowship, Natural Sciences** Boston University, Boston, USA Supervisor: Prof. Pete Buston
2023 – 2025	**Postdoctoral Researcher**, University of Massachusetts Boston, Boston, USA Supervisor: Prof. Albert Kao
2019 – 2023	**PhD rer. nat.**, Humboldt Universität zu Berlin, Berlin, Germany (*magna cum laude*) Supervisor: Prof. Pawel Romanczuk
2016 – 2019	**M.S. Biology**, Max Planck Institute for Ornithology, Radolfzell, Germany (1.3) Supervisor: Prof. Alex Jordan
2011 – 2014	**B.S. Biology**, University of Konstanz, Germany (2.4)
2001 – 2009	**High School Diploma (Abitur)**, Gymnasium Pfarrkirchen, Germany (1.9)

Research

Grants, Fellowships and Awards

2025	NSF Division of Integrative Organismal Systems (IOS) -Behavioral Systems (*in prep.*)
2025	Dean's Postdoctoral Research Fellowship, Boston University, USA ($134.000)
2024	Joseph P. Healey Research Grant, University of Massachusetts Boston (10.000$)
2024	NSF Postdoctoral Research Fellowship in Biology (Rated Meritorious, Unsuccessful)
2024	Life Sciences Research Foundation Postdoctoral Fellowship (Unsuccessful)
2023	NSF Postdoctoral Research Fellowship in Biology (Rated Meritorious, Unsuccessful)
2023	Life Sciences Research Foundation Postdoctoral Fellowship (Unsuccessful)
2023	Postdoctoral Research Fellowship, University of Massachusetts, USA ($195.000)

Publications

Bierbach, D., Lukas, J., Gómez-Nava, L., **Francisco, F. A.**, Arias-Rodriguez, L., Krause, S.,... Krause, J. (2025). Collective escape waves provide a generic defence against different avian predators. *Royal Society Open Science*, 12(3), 241055.

Barr, T.S., Richards, A., **Francisco, F. A.** & Vidal, M.C. (2025) Diet C:N ratio and temperature influence the performance and colouration of tobacco hornworms. *Ecological Entomology*, 50(4), 708716.

Sampaio, E., Sridhar, V. H., **Francisco, F. A.**, Nagy, M., Sacchi, A., Strandburg-Peshkin, A., ... Couzin, I. D. & Gingins, S. (2024). Multidimensional social influence drives leadership and composition-dependent success in octopusfish hunting groups. *Nature Ecology & Evolution*, 8(11), 2072-2084.

Escurra-Alegre, A., **Francisco, F. A.**, Schäfer, F., Wuertz, S., Kloas, W., & Bierbach, D. (2024). Behavioral repertoire of Arapaima gigas (Schinz, 1822) reared in captivity and its implication for welfare protocols: Behavior of the arapaima. *Tropical Aquaculture*, 2(1), e5730.

Kao, A. B., Banerjee, S. C., **Francisco, F. A.**, & Berdahl, A. M. (2024). Timing decisions as the next frontier for collective intelligence. *Trends in Ecology & Evolution*, 39(10), 904-912.

Francisco, F. A. (2023). Adaptation and Learning in Fish: Effect of individual behavioral and informational variation on collective outcomes. PhD Dissertation, Humboldt Universität zu Berlin (Germany).

Ehlman, S. M., Scherer, U., Bierbach, D., **Francisco, F. A.**, Laskowski, K. L., Krause, J., & Wolf, M. (2023). Leveraging big data to uncover the eco-evolutionary factors shaping behavioural development. *Proceedings of the Royal Society B*, 290(1992), 20222115.

Majoris, J. E., **Francisco, F. A.**, Burns, C. M., Brandl, S. J., Warkentin, K. M., & Buston, P. M. (2022). Paternal care regulates the timing, synchrony and success of hatching in a coral reef fish. *Proceedings of the Royal Society B*, 289(1982), 20221466.

Bierbach, D., Gómez-Nava, L., **Francisco, F. A.**, Lukas, J., Musiolek, L., Hafner, V. V., ... & Krause, J. (2022). Live fish learn to anticipate the movement of a fish-like robot. *Bioinspiration & Biomimetics*, 17(6), 065007.

Bierbach, D., **Francisco, F. A.**, Lukas, J., Landgraf, T., Maxeiner, M., Romanczuk, P., ... & Krause, J. (2021). Biomimetic robots promote the 3Rs Principle in animal testing. In *Artificial Life Conference Proceedings 33* (Vol. 2021, No. 1, p. 36). MIT Press.

Rodriguez-Santiago, M., Nührenberg, P., Derry, J., Deussen, O., **Francisco, F. A.**, Garrison, L. K., Garza, S. F., Hofmann, H. A. and Jordan, A. (2020). Behavioral traits that define social dominance are the same that reduce social influence in a consensus task. *Proceedings of the National Academy of Sciences*, 117(31), pp.18566-18573.

Francisco, F. A., Nührenberg, P., & Jordan, A. (2020). High-resolution, non-invasive animal tracking and reconstruction of local environment in aquatic ecosystems. *Movement ecology*, 8(1), 27.

Majoris, J. E., **Francisco, F. A.**, Atema, J., & Buston, P. M. (2018). Reproduction, early development, and larval rearing strategies for two sponge-dwelling neon gobies, Elacatinus lori and E. colini. *Aquaculture*, 483, 286-295.

Publications in Review and Pre-prints

Banerjee S. C., **Francisco, F. A.**, Kao A. B. (2025). A tale of two birds: cognitive simplicity drives collective route improvements in homing pigeons. eLife. *under review*

Bartashevich, P., **Francisco, F.A.**, Escurra-Alegre, A., Schäfer, F., Wuertz, S., Krause, J., Kloas, W. and Bierbach, D., Synchronization of the collective air-breathing behavior in juvenile Arapaima gigas. bioRxiv (2025).

Francisco, F.A., Lukas, J., Stöcker, A., Romanczuk, P. and Bierbach, D., Experienced social partners hinder learning performance in naive clonal fish. bioRxiv, (2022).

Publications in Preparation

Francisco, F. A., Kesim, L. A. and Bierbach D., The Effect of Familiarity Among Social Partners on the Jumping Behavior of Amazon mollies. *in preparation for submission in December 2025*

Francisco, F. A. & Banerjee S. C. and Kao A. B., Game-theoretic trade-offs between individual reward maximization and collective efficiency in fish schools. *in preparation for submission in March 2026*

Bennett-Smith, M., Beredo, S., Westwood, J., Joa-Griffith, M., Byrne, A., **Francisco F. A.**, Thompson, K., Francis and R., Buston, P. M., Do Anemones or Anemonefish Confer Their Partners With Resilience to Heat Stress? *in preparation for submission in Februrary 2026*

Invited Seminars

2026	Invited Speaker, Ecology, Behavior & Evolution Chalk Talks, Boston University, Boston, USA
2026	Invited Speaker, Departmental Seminar, University of Washington, Seattle, USA
09.02.2026	Invited Speaker, Prof. Boqing Gong Lab Meeting, Boston University, Boston, USA
01.02.2021	Invited Speaker, Undergraduate Journal Club, Freie Universität, Berlin, Germany
19.02.2021	Departmental Meeting, Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Berlin, Germany

Conference Presentations

17 – 20.11.2022	Conference of the Gesellschaft für Ichthyologie GfI e.V., Vienna, Austria
02 – 04.12.2021	Conference of the Gesellschaft für Ichthyologie GfI e.V., Online
08 – 10.11.2019	Conference of the Gesellschaft für Ichthyologie GfI e.V., Bonn, Germany
19 – 20.07.2018	Alpine Tanganyikan Cichlid Symposium, Konstanz, Germany
05.02.2017	Symposium on Lake Tanganyikan Cichlid Behaviour, Konstanz, Germany

Teaching and Mentoring

Teaching

02 – 06.02.2026	Co-Organizer of International Workshop, University of Padova, Italy Title: 3D Tracking with TRex
2022	Weekly Departmental Tutorial, Humboldt Universität zu Berlin, Germany Programming Tutorial: Python and R for Beginners
2018 & 2019	Graduate Student Instructor, University of Konstanz, Germany Field Course: Going Wild: Behavior and Ecology of Animals (#BIO-16900)

Mentorship

Paige Becker	Boston University	PhD	*present*
Zeynep Daldaban	Humbold Universität zu Berlin	MSc	2023
Suman Deyashi	Humbold Universität zu Berlin	MSc	2023
Nele Russy	Humbold Universität zu Berlin	BSc	2023
Lily Racky	Humbold Universität zu Berlin	BSc	2023
Alessandra Escurra-Alegre	Humbold Universität zu Berlin	MSc	2022
Christopher Schutz	Humbold Universität zu Berlin	BSc	2022
Jakob Sölter	Humbold Universität zu Berlin	Student Project	2022
Helene Hollitzer	Humbold Universität zu Berlin	Student Project	2021
Leonidas Skopeteas	Humbold Universität zu Berlin	BSc	2021

Service to the Community

Academic Citizenship

2019 – 2022	**PhD Representative on the Executive Board** Excellence Cluster "Science of Intelligence", Berlin, Germany
2019 – 2021	**Member of the Curriculum Development Committee** Excellence Cluster "Science of Intelligence", Berlin, Germany

Outreach

2024	International Education Week Photo Contest, University of Massachusetts Boston (Winner)
10.11.2021	Berlin Science Week Presentation titled "Why Behaviour?", Berlin, Germany

Journals Reviewed

Animal Behaviour (1) • Ecology and Evolution (1) • Methods in Ecology and Evolution (1) • Behavioral Ecology and Sociobiology (2) • PCI Ecology (1) • Journal of Fish Biology (1)

Additional Training and Experience

Research Training

01 - 14.07.2022	**DINACON**, DreamSpace Academy, Batticaloa, Sri Lanka
22.05 - 11.06.2022	**CAJAL Summer School on Quantitative Approaches to Behaviour** Champalimaud, Lisbon, Portugal
02 - 03.10.2021	**Complex Networks and Collective Information Processing Workshop** Humboldt University, Berlin, Germany
30.04.2020	**Physics of Behavior Workshop (Virtual)**, TMLS, Emory University, USA
10 - 11.12.2018	**DeepLabCut Workshop**, Munich, Germany
15 - 21.07.2017	**Summer School LabEx Tulip** Integrative Biology & Ecology. Midi-Pyrénées, France

Work Experience

2025 – *present*	**Guest Researcher** University of Massachusetts, Boston, USA
2019 – 2022	**Guest Researcher** Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Berlin, Germany
2022	**Field Assistant**, J. Krause, Teapa, Mexico
2018 – 2019	**Beekeeper / Lab Assistant**, G. Galizia Lab, Konstanz, Germany
2017	**Diver / Field Assistant**, A. Jordan Lab, Mpulungu, Zambia
2017	**Diver / Field Assistant**, I. Couzin Lab, Eilat, Israel
2015	**Field Assistant / Lab Technician**, P. Buston Lab, Southwater Caye, Belize
2009 – 2015	**Landscape Gardener**, H&W Irrigation systems, Steina, Germany
2009 – 2012	**Beekeeper**, APICON Apiary, Egglham, Germany
2009 – 2010	**Civil Service**, Regional Hospital, Pfarrkirchen, Germany

Personal Qualifications

Languages	Fluent in English and German (native)
Programming	Python, R, C++, Arduino IDE, HTML, LaTeX
Tools & Systems	OpenCV, Git, UNIX/Linux systems
Experimental Skills	Behavioral assays, fish husbandry, process automation
Diving Certification	European Scientific Diver (KFT-ESD D-340), AAUS Scientific Diver (Cert: #33644)
Other Licenses	German motorboat and sailing license (A, D, Patent Nr. 6375678)