CURRICULUM VITAE

(April 20, 2024)

PERSONAL INFORMATION	Name: Christian Hilbe Address: August Thienemannstr. 2, 24306 Plön, Germany Phone: +49 157 33164895 Mail: hilbe@evolbio.mpg.de Homepage: http://web.evolbio.mpg.de/social-behaviour/
RESEARCH INTERESTS	Classical and evolutionary game theory and its applications in biology and the social sciences, using the tools of stochastic processes and dynamical systems
TEACHING INTERESTS	**Quantitative Methods:** Calculus, linear algebra, ordinary differential equations and dynamical. systems, stochastic processes, probability theory and statistics. **Applications:** Biomathematics, evolutionary and classical game theory
CURRENT POSITION	**Max Planck Institute (MPI) for Evolutionary Biology, Germany** (Since 10/2019) Group leader, Max Planck Research Group Dynamics of Social Behavior *Description:* The group currently consists of 3 Post-Docs (Nikoleta Glynatsi, Julien Lie-Panis, Charlotte Rossetti), and a visiting PhD student (Xiaomin Wang). The group members have backgrounds from different disciplines, including applied mathematics, psychology, and economics. We work on computational models of social behavior, learning, and cooperation.

PREVIOUS POSITIONS	**Institute of Science and Technology (IST) Austria** Research scientist in the Chatterjee group (Krishnendu Chatterjee)	2015 – 2019
	Harvard University, USA Research scientist at the Program for Evolutionary Dynamics (Martin Nowak)	2013 – 2015
	Max Planck Institute for Evolutionary Biology, Germany Research scientist at the Evolutionary Theory Group (Arne Traulsen)	2011 – 2013
	University of Vienna, Austria Research scientist at the Faculty of Mathematics (Karl Sigmund)	2008 – 2011

RESEARCH STAYS	**Harvard University** (several visits)	2016 – 2019
	Max Planck Institute for Evolutionary Biology (several visits)	2014 – 2015
	Center of Rationality, Hebrew University, Israel	2010 – 2011
	International Institute for Applied Systems Analysis (IIASA), Austria. Participant of the Young Scientists Summer Program	2009

HIGHER EDUCATION	**PhD in Mathematics, University of Vienna** Thesis: "Public good games with incentives", Advisor: Karl Sigmund Graduated 'sub auspiciis Praesidentis rei publicae', the highest honor in Austria	03/2012
	MSc in Mathematics, University of Vienna	09/2008

GRANTS AND FELLOWSHIPS	**ERC Starting Grant**, European Research Council (**EUR 1,439,000**) Panel LS8 – Evolutionary, Population and Environmental Biology Project: *"Evolution of direct reciprocity in complex environments"*	2019
	IST Fellowship, funded by the People Programme (Marie Curie Actions) of the EU's Seventh Framework Program (**EUR 159,759**) Project: *"Partner and rival strategies in repeated games"*	2015
	Erwin Schrödinger Fellowship, Austrian Science Fund (**EUR 80,118**) Project: *"The evolution of extortion in repeated games"*	2013

TRAVEL GRANTS, AWARDS	**International exchanges grant** of the Royal Society (UK), for a collaboration with Prof. Hong Duong of the University of Birmingham (£ 11,960 in total).	2022
	Award of excellence ("Würdigungspreis") of the Ministry of Science and Research, awarded to Austria's top 50 students (EUR 2,500 each)	2009, 2012
	Excellence scholarship of the University of Vienna (EUR 4,500)	2012
	Appreciation Award of the State Vorarlberg in recognition of my graduation 'sub auspiciis Praesidentis rei publicae' (EUR 2,000)	2012
	Mikhalevich Award of the International Institute for Applied Systems Analysis	2010

PROFESSIONAL ACTIVITIES, COMMUNITY SERVICE

- **Group leader representative** and **Member of the Graduate Student Committee** at the Max Planck Institute for Evolutionary Biology (since 2021).
- **External reviewer** for the PhD thesis of Cong Li (Mathematics, University of Montreal, 2020) and of Peter S. Park (Mathematics, Harvard University 2023).
- Member of the **thesis advisory committee** for Christin Nyhoegen, MPI for Evolutionary Biology (2020-2023), and Maria Alejandra Ramirez, MPI for Evolutionary Biology (2022-2024).
- **Grant referee** for the National Science Foundation (NSF); German Research Foundation (DFG); Hungarian National Research, Development, and Innovation Office (NKFI); Hong Kong Research Grants Council; Cultural Evolution Society Transformation Fund.
- **Associate editor** for PLoS Computational Biology (since 11/2021) and the Proceedings of the Royal Society B (since 04/2024).
- **Guest editor** for the Proceedings of the National Academy of Sciences, and for PLoS Computational Biology;
- **Editor for a special issue** in GAMES on *Cooperation, Trust, and Reciprocity* (2015); and in Dynamic Games and Applications on the *50th anniversary of evolutionary game theory* (2023).
- **Journal referee** for Nature, Nature Human Behaviour, Nature Climate Change, Nature Sustainability, Nature Communications, Science Advances, PNAS, Proceedings of the Royal Society B, PLoS Computational Biology, Journal of Theoretical Biology, Journal of Mathematical Biology, Bulletin of Mathematical Biology, Theoretical Population Biology, Dynamic Games and Applications, Trends in Ecology and Evolution, among others.

- Learning, Evolution, and Games (Amsterdam 2023)
  Talk: *Evolutionary instability of selfish learning*

- Workshop: The Future of Mathematical Social Science (Pennsylvania 2023, virtual)
  Talk: *Evolutionary game theory — the status quo and the gaps*

- Social Dilemmas (Copenhagen 2022)
  Talk: *A unified framework of direct and indirect reciprocity*

- Mathematical Models in Ecology and Evolution (Reading 2022)
  Talk: *A unified framework of direct and indirect reciprocity*

- Workshop: Future of Games in Biology (Plön 2022)
  Talk: *Evolution of cooperation – what has happened, where are the gaps?*

- European Human Behavior and Evolution Association (Leipzig 2022, virtual)
  Poster: *A unified framework of direct and indirect reciprocity*

- Oskar Morgenstern Platz Meeting (Vienna 2021)
  Talk: *Robust cooperation in alternating games*

- Workshop on Evolutionary Game Theory (Vienna 2019)
  Talk: *Social dilemmas among unequals*

- Ernst Strüngmann Forum (Frankfurt 2019)
  Discussion paper: *The evolution of strategic ignorance in strategic interaction*

- GAMENET (Cracow 2018)
  Talk: *Extortion and cooperation in repeated games*

- Mathematical models in Ecology and Evolution (London 2017)
  Talk: *The signal-burying game: Why we hide positive traits and good deeds*

- European Conference for Mathematical and Theoretical Biology (Nottingham 2016)
  Talk: *Extortion and generosity in repeated games*

- Symposium in honor of Karl Sigmund's 70th birthday (Vienna, 2015)
  Talk: *Extortion and generosity in repeated games*

- Workshop: Current topic workshop: Evolutionary game theory (Columbus, 2015)
  Poster: *Extortion and generosity in repeated social dilemmas*

- Evolution 2012 (Ottawa 2012).
  Talk: *Emergence of responsible sanctions*

- European Conference on Complex Systems (Vienna 2011)
  Talks: *Evolution of cooperation and punishment in non-anonymous societies*, and
  Equilibrium selection with representation effects

- Second Baltic Autumn School: Workshop on Systems Biology (Lübeck 2011)
  Talk: *Evolutionary game theory*

- Workshop on Evolutionary approaches to international cooperation (Tilburg, 2011)
  Talk: *Public good games under time pressure*

- TECT Conference (The evolution of cooperation and trading, Budapest 2010)
  Talk: *Incentives and opportunism: From the carrot to the stick*

- Center for Humans & Machines, MPI for Human Development (Jan 2024)
  Talk: *The evolutionary game theory of cooperation, social norms, and modesty*

- Peking University (Nov 2023, virtual)
  Talk: *Modeling direct and indirect reciprocity*

- Dalian University (March 2023, virtual)
  Talk: *Evolution of cooperation in asymmetric social dilemmas*

- Cooperation colloquium (Feb 2023, virtual)
  Talk: *A brief history of modeling direct and indirect reciprocity*

- Technical University Graz (Feb 2023)
  Talk: *Exploring human cooperation with models and data*

- University of Vienna (March 2022, virtual)
  Talk: *Cooperation in alternating interactions with memory constraints*

- Technical University Munich (Feb 2022, virtual)
  Talk: *Memory-n strategies of direct reciprocity*

- Beijing Institute of Technology (Dec 2021, virtual)
  Talk: *The mathematics of direct reciprocity*

- Institute of Mathematics, University of Lübeck (Nov 2021)
  Talk: *The dynamics of direct reciprocity under memory constraints*

- cege Research Colloquium, University of Göttingen (June 2021, virtual)
  Talk: *The evolution of direct and indirect reciprocity*

- Institute for Advanced Study in Toulouse General Seminar (June 2021, virtual)
  Talk: *The evolution of indirect reciprocity under noisy and incomplete information*

- Max Planck Research Group Leader Meeting (May 2020, virtual)
  Talk: *Evolution of reciprocal cooperation.*

- University of Vienna, Vienna (Jan 2020).
  Talk: *The dynamics of direct and indirect reciprocity.*

- University of Exeter, Exeter UK (Nov 2019).
  Talk: *Social dilemmas among unequals.*

- University of Vienna, Vienna (Oct 2019).
  Talk: *Social dilemmas among unequals.*

- University of British Columbia, Vancouver (Jan 2019).
  Talks: *The evolution of indirect reciprocity under noisy and private information*, and *Modeling the dynamics of extortion and cooperation in repeated games.*

- Research Platform Cognitive Science, Vienna (Oct 2018).
  Talk: *Direct reciprocity under cognitive constraints.*

- Department of Economics, Middlesex University, London (Jan 2018)
  Talk: *Extortion and cooperation in repeated games.*

- Max Planck Institute for Mathematics in the Sciences, Leipzig (Apr 2017)
  Talk: *Extortion and cooperation in repeated games.*

- Max Planck Institute for Research on Collective Goods, Bonn (Oct 2016)
  Talk: *Extortion and generosity in repeated games.*

- Colloquium for Complex Systems and Modeling, University of Oldenburg (Jan 2013)
  Talk: *Reputation, opportunism, and the evolution of punishment.*

- Institute for Social Policy, Vienna University of Economics and Business (Mar 2012)
  Talk: *Leadership in collective action.*

TEACHING EXPERIENCE	*Course:* **Dynamics of Social Behavior** (2022). *Audience:* Participants of the Helsinki Summer School On Mathematical Ecology and Evolution *Content:* Basic concepts of classical and evolutionary game theory, and how these concepts can be applied to make sense of human cooperation and social norms. *Course:* **Mathematical Biology in Action during the Corona Pandemic** (2021-2022). *Audience:* Jointly with members of the Evolutionary Theory Department of the MPI, held at the Mathematics Department of the University of Lübeck, Germany. *Content:* I taught a class on statistical methods relevant to epidemiology and to measuring the efficacy of vaccines, and a general summary class. *Course:* **Classical Game Theory** (2021). *Audience:* Students of the International Max Planck Research School for Evolutionary Biology, at the MPI for Evolutionary Biology *Content:* Basic concepts of classical game theory (static and dynamic games, with complete or incomplete information), and its applications in the social sciences. *Course:* **Math 153 and Math 243 on Evolutionary Dynamics** (2014–2019). *Audience:* Various guest lectures at Harvard University *Content:* Discussing models and experimental evidence for cooperation in repeated games. *Course:* **Evolutionary game theory – from basics to recent developments** (2012–2013). *Audience:* Jointly with Arne Traulsen and Philipp Altrock, held at the Mathematics Department of the University of Lübeck. *Content:* I taught classes on classical game theory, and on the analysis of reciprocal interactions.

PHD STUDENT SUPERVISION	**Marta Couto** (MPI for Evolutionary Biology, University of Lübeck). PhD thesis: *Mathematical models of cooperation among heterogeneous individuals.* Two joint papers published (New J. Physics, 2022; Phil. Trans. Royal Soc. B, 2023), one more in preparation. Currently a Post-Doc at the **University of Amsterdam**.	2020–2024
	Charlotte Rossetti (MPI for Evolutionary Biology, University of Kiel). PhD thesis: *Mechanisms and Benefits of Reciprocal Relationships.* Three joint papers published (Curr. Op. Psych., 2022; Nature Comput. Sci., 2022; Ethology 2023), one more submitted. Accepted a Post-Doc at **University of Zürich**.	2020–2024
	Saptarshi Pal (MPI for Evolutionary Biology, University of Kiel). PhD thesis: *The role of information on the evolution of cooperation.* First joint paper published (Nature Comms., 2022), three more in preparation. Currently a Post-Doc at **Harvard University**.	2020–2024
	Peter Park (Harvard University). Co-supervision of PhD thesis on *Game theory and the evolution of human cognition.* First joint paper published (Nature Comms., 2022). Currently a Post-Doc at **MIT**.	2020–2023
	Laura Schmid (Institute of Science and Technology Austria). Co-supervision of PhD thesis *Evolution of cooperation via (in)direct reciprocity under imperfect information.* Five joint articles published (e.g., PNAS, 2018; Nat. Hum. Behav., 2021; Nat. Comms., 2023). Currently a Post-Doc at the Korean Advanced Institute for Science and Technology (**KAIST**).	2016–2021

UNDERGRADUATE SUPERVISION	**Logan Cartau** (University of Rennes, France). Internship on direct reciprocity in co-evolving populations	2021
	Farbod Ekbatani (Sharif University of Technology, Tehran). Internship on evolution of norms; resulted in a publication (Nat. Comms. 2023).	2019
	Rachel Gologorsky (Harvard University). Bachelor's thesis on endogenous game choice, won the Harvard College Thomas T. Hoopes Prize.	2018–2019
	Pouya Shati (Sharif University of Technology, Tehran). Internship; resulted in a publication (Sci. Rep. 2021).	2018
	Štěpán Šimsa (Charles University Prague). Bachelor's thesis; resulted in two publications (Nature 2018, Nat. Comms. 2023)	2016
	Kate Donahue (Harvard University). Bachelor's thesis, won the Harvard College Thomas T. Hoopes Prize, and the Herb Alexander award. Published as article (Nature Comms., 2020).	2015
	Sarah Schoenmakers (University of Oldenburg). Master thesis, also published as an article (J. Theor. Biol., 2014).	2013

PUBLIC OUTREACH

I like to engage with the (general and scientific) public to illustrate the applications of mathematics in other sciences and in daily life. As part of these activities, I have done the following.

- Counselor for a youtube video on the repeated prisoner's dilemma by the content provider 'Veritasium' (2023)
- Public Lecture "Mathematics of cooperation", MPI for Evolutionary Biology (2020)
- IST Alumni talk, addressing career options for Post-Docs and Grant Writing (2020)
- Course on game theory for the Lower Austrian Talent's Academy (2018)
- Participation at the Long Night of Research, and IST Open Campus (2016-2017)
- My work has been featured in various news outlets and blogs, including
  Der Standard, Frankfurter Allgemeine Zeitung, Scientific American, Wired, Guardian Liberty Voice, Quanta Magazine, Harvard Gazette, and Nature News

MAJOR COLLABORATORS

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