

THE VIEWPOINT COLUMN

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SHOULD CONFERENCES STILL REQUIRE MANDATORY ATTENDANCE?

A COLUMN BY THEORETICAL COMPUTER SCIENTISTS FOR FUTURE (TCS4F)

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Abstract

Theoretical Computer Scientists for Future (TCS4F) is an initiative aimed at making research in theoretical computer science environmentally sustainable. This article presents TCS4F and gives a perspective on the current question of mandatory attendance at academic conferences.

The issue of climate change has been on our collective mind for decades. Each passing year improves our scientific understanding of the problem, and narrows down our uncertainty about the need to drastically reduce worldwide greenhouse gas emissions. As the window of opportunity is closing, and concrete action is slow to materialize, more and more groups from seemingly unrelated areas find themselves advocating for change.

TCS4F¹ is one such initiative: it is lead by computer scientists, and aims at making research in theoretical computer science environmentally sustainable. It started in 2020 with a manifesto that can be signed by researchers, conferences, and research groups. The pledge taken by signers is to follow a sustainable emissions trajectory: reduce emissions by at least 50% before 2030 relative to pre-2020 levels. The TCS4F manifesto was signed by 199 individual researchers (and counting!), 3 research groups, the 2022 edition of the ICALP conference, and the 3 conferences CSL, STACS, and Highlights of Logic, Games, and Automata.

The contribution of theoretical computer science research to the climate crisis is two-fold. On the one hand, we may be able to improve the situation through our research. For instance, we can improve the efficiency of algorithms and hope

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¹<https://tcs4f.org/>

to reduce the footprint of the ICT sector — though our efforts may well have the opposite effect because of Jevon’s paradox! On the other hand, we should also think about the present impact of our research activities on the environment, and try to adapt our practices to be more sustainable.

It may be unclear at first how theoretical research harms the environment — is it about the consumption of draft paper? Whiteboard markers? In fact, while our activities can emit greenhouse gases in many ways, the main factor in our climate impact is probably long-haul plane trips. Indeed, our research field is structured around international conferences. Their stated aim is to give the community a place to meet, discuss, and exchange new ideas. Prestigious conferences are also the most important means of recognition in our community: they are a must-have on one’s CV when applying for research positions. For PhDs and researchers on short-term positions, publishing there is not a choice but has become a vital professional necessity. And, until recently, publishing at international conferences naturally meant that you had to fly across the world and be there.

It is in this context that we launched TCS4F in early 2020. This coincidentally followed Vardi’s “Publish and Perish” CACM column [4], which advocated for optional attendance to conferences in the name of environmental sustainability. As we all know, shortly afterwards, the COVID-19 epidemic moved all conferences online almost overnight. This forced experiment gave us a taste of what could be the closest online replacement for traditional conferences — if organized on short notice and by necessity rather than choice. The situation left us yearning for the golden days of in-person conferences and lively bar discussions in exotic locations, and the question of flight-induced climate change was not very pressing while we were stuck at home during lockdowns.

Once the COVID situation improved, many conferences adopted some kind of hybrid format, pragmatically acknowledging the fact that travel was not possible for everyone. These experiments revealed that it is comparatively easy to accommodate remote speakers, and to stream talks to a remote audience, which some conferences already had experience with. However, integrating the in-person and remote worlds proved challenging, especially for coffee breaks and social events. Based on this, some conferences are now back to firm requirements for in-person attendance, and are making explicit what used to be an implicit rule: “all talks are in-person” at ICALP’23, online talks will be for “travel restrictions or other exceptional situations” at ICDT’24... The intent may be to encourage participants to travel so everyone can enjoy a better conference... or to ensure that universities will continue to reimburse trips. Also, a fully in-person conference is of course simpler to organize, and closer to what we are used to.

These rules arguably reveal an inconvenient truth: many conferences are now attracting participants whose main goal is to have their paper published (at a prestigious venue, and on a predictable timeline), and not necessarily to attend the

event. Of course, the general will to travel and meet is still very much alive — as can be seen at events without formal proceedings, such as the Highlights workshop series. But coupling formal publications with an in-person gathering no longer makes sense for everyone.

We argue at TCS4F that decoupling the two is necessary, because plane travel is unsustainable at the scale at which we practice it. Flying across the world to a conference can amount to several tons of CO₂-equivalent emissions, exceeding sustainable targets for individual yearly footprints in 2030 [2], and there are no plausible technological pathways for low-carbon intercontinental travel by then. Thus, our position at TCS4F is that, if everyone is to do their part to mitigate climate change, we must fly less — and attend less international conferences in person.

However, I believe that mandatory travel is also a question of diversity and inclusion. In-person conferences are an exclusive club for frequent travelers, and exclude people with insufficient funding to travel, people from countries who cannot easily obtain visas, people with disabilities, and people with caretaking obligations (which disproportionately affect women). For instance, the relative proportion of women participants at the 2020 International Conference on Learning Representations (online) was 20%, versus 15% at ICLR'2019 (in-person) — a 33% increase [3]. Our focus on in-person conferences thus overlooks a silent majority of people for which online attendance is the only feasible way to participate. Further, if prestigious conferences are in-person only, then recognition in our community is reserved to the privileged few who can meet this obligation.

Of course, my point is not that in-person conferences should be eliminated altogether. As we all know from the COVID era, online events are not perfect, and in-person socializing has no known replacement. Traveling to conferences is still important, and can be done responsibly — going there by train if possible, picking geographically closer locations, or simply going there less often. Online and hybrid events can also play a role, as do other forms of online research: online videos², online seminars³, the Theoretical Computer Science Stack Exchange⁴, etc. These new formats are especially promising when they do not try to mimic what already exists, but instead leverage features specific to the Internet: asynchronicity, low friction, low-cost, machine interpretability, long-term archival... Overall, it is very challenging to balance the scientific value of international in-person meetings with their environmental impact. But every member of our community should have a say in this choice, and it should be guided by careful deliberation — not simply by reverting to the default 20th-century-style

²For instance ScienceCast: <https://sciencecast.org/>

³For instance <https://researchseminars.org/>

⁴<https://cstheory.stackexchange.com/>

conference culture.

It is not yet clear how the conference landscape will evolve after COVID: which conferences will settle on a new format in the long run, and which ones will revert to the pre-COVID rule of mandatory participation barring extenuating circumstances. We have tried to survey this at TCS4F [1]. For conferences with optional in-person attendance, it is not clear how much organizers will encourage or discourage participants to travel, and how researchers will respond. These questions should probably be debated in our community, so the system can achieve the best compromise between scientific value, inclusivity, and environmental sustainability. But, specifically for prestigious conferences with formal proceedings, our short-term hope is that future call for papers will allow publication without in-person attendance.

We are interested at TCS4F to hear about the views of the community on this important issue. Should conference publication be conditioned to onsite participation? How should our conference culture change to be sustainable and inclusive? We are interested to hear your views at contact@tcs4f.org.

More reading

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- Moshe Vardi. The paradox of choice in computing-research conferences, *Commun. ACM*, 2021, <https://cacm.acm.org/magazines/2021/11/256373-the-paradox-of-choice-in-computing-research-conferences/fulltext>.
- TCS4F blog, <https://tcs4f.org/blog>.
- Flying less in academia: A resource guide, <http://flyinglessresourceguide.info/>.
- ALLEA. Towards climate sustainability of the academic system in Europe and beyond, <https://allea.org/wp-content/uploads/2022/05/ALLEA-Report-Towards-Climate-Sustainability-of-the-Academic-System.pdf>.

References

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- [2] Tim Gore. Per capita consumption emissions and the 1.5 degrees goal, 2021. <https://www.oxfam.org/en/research/carbon-inequality-2030>.
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