

Report of the EDBT/ICDT-2020 Climate Change Session and Recommendations for Future Editions

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The 2020 edition of EDBT/ICDT featured for the first time a climate change session, to discuss the issue of global warming, its implications on our research, and how future editions of the conference should be organized. Concomitantly, the COVID-19 pandemic has forced this EDBT/ICDT edition and all other international conferences to switch to an entirely online model on short notice, which has given the community a taste of alternative ways to hold scientific conferences. This document summarizes this session, the outcomes of its discussion, and the relevant parts of the participant survey held after EDBT/ICDT'20. It further makes some recommendations of how EDBT/ICDT could help mitigate climate change.

1 SUMMARY ON CLIMATE CHANGE

Human activity since the Industrial Revolution has been releasing increasing quantities of greenhouse gases, leading to an increase in the atmospheric concentration of such gases and an ongoing change in the planet's climate, with considerable potential for harm to human civilizations in the coming decades. To mitigate this, we must reduce the carbon impact of our activities. International bodies such as the IPCC panel of the United Nations are advocating a 45% reduction of carbon dioxide emissions by 2030 relative to 2010 levels, so as to limit global warming to 1.5 degrees Celsius and mitigate its effects. Achieving such a reduction requires a considerable overhaul of our existing societies. The issue of climate change concerns EDBT/ICDT in at least two respects. First, our research focuses on computing, and this broad area has a significant carbon footprint: the field of information and communications technology in general is estimated to contribute about 4% of the world's greenhouse gas emissions, and is planned¹ to increase to 8% by 2025. Second, the practice of organizing in-person international conferences also has significant impact: air travel currently accounts for 2-3% of the world's greenhouse gas emissions², with a round-trip flight between Lisbon and Copenhagen accounting for around 1 ton of equivalent CO₂ emissions, which is already half of a person's sustainable yearly carbon budget³.

2 THE CLIMATE CHANGE SESSION

The climate change session took place on Zoom, as did the rest of the EDBT/ICDT conference. The slides of the event are available online⁴.

¹Source: https://theshiftproject.org/wp-content/uploads/2019/03/Lean-ICT-Report_The-Shift-Project_2019.pdf

²Source: <https://ourworldindata.org/co2-emissions-from-aviation>

³Source: https://www.atmosfair.de/en/green_travel/annual_climate_budget/

⁴URL: https://a3nm.net/work/talks/icdt2020/amarilli2020climate_slides.pdf

The event was attended by around 60-70 people, and was followed by a discussion, on Zoom and on the Slack workspace of the conference.⁵

3 SUMMARY OF DISCUSSIONS

The discussion led to a presentation of related initiatives about climate change and computer science. For instance, an insightful CACM article by Vardi⁶ already advocated in January 2020 that all conferences should allow authors to present their papers remotely by video. The COVID-19 pandemic has temporarily made this a reality, but for reasons unrelated to climate. Further, the TCS4F initiative⁷ already allows scientific conferences, individual researchers, and research teams to pledge to a reduction of their CO2 emissions⁸.

The discussion pointed out that not all transportation means have the same impact. For instance the CO2 footprint of 1km traveled by high-speed rail travel is less than 1 km traveled by plane, sometimes by an order of magnitude. To explore possible options, the website Rome2rio⁹ can be used to find possible ways to travel from one point to another. To adapt the organization of our conferences, several measures were proposed:

- Measuring the carbon footprint of future EDBT/ICDT conferences: at conference registration, ask participants for travel details (where from/to, which transportation mode), use this to compute the footprint and track it over time, release an anonymized dataset.
- Having a followup to the climate change discussion at future EDBT/ICDT conferences.
- Signing the TCS4F pledge.
- Adopting an online or hybrid model.
- Reducing the CO2 impact of conference meals, by making it easy for participants to eat less meat (e.g., more vegetarian buffet options).

Some challenges were mentioned in terms of timezones for online conferences, technical issues to making hybrid events work and making the experience for online participants compelling, and the financial aspect of who should bear the costs of organizing the conference. The common impression was that online participants should be charged the online costs (e.g., Zoom fees) and the on-site cost should be paid by on-site participants; it was proposed that the conference talks could be made available for free if it has no costs for the organizers (e.g., via Youtube Live).

There was a discussion of the advantages of holding an online conference: talks of better quality and predictable length, less people missing from the first/last sessions, reduced participation fee, and also attracting many participants who couldn't have traveled to the onsite event. It was pointed out that the

⁵URL: <https://edbticdt2020.slack.com/channel#climate-change>

⁶URL: <https://cacm.acm.org/magazines/2020/1/241717-publish-and-perish/fulltext>

⁷URL: <https://tcs4f.org/>

⁸Disclaimer: one author of this document is also involved in TCS4F.

⁹URL: <https://rome2rio.com/>

benefits of online vs onsite conferences would be easier to evaluate if we had an explicit list of goals for EDBT/ICDT; some goals were proposed and discussed to this end.

There were some pointers to existing, pre-COVID-19 events, such as the hybrid CCC¹⁰, the hybrid Debian Conference¹¹, and the hybrid Neuromatch¹². There is also a study¹³ listing existing conferences by discipline and practices. In terms of tools, beyond Zoom and Slack, some of these conferences also used Crowdcast and Mattermost. Virtual spaces like gather.town, lounjee.com, forms-wizard.com must also be investigated. There were some ideas in terms of accepting more talks, having longer days, having social opportunities for online talks, having groups of participants connected by a similarity computation, and making “hubs” so that participants of a city/country could attend the remote event together.

There was also pointers to ongoing efforts to move conferences online because of COVID-19, e.g., ASPLOS¹⁴ and the ACM report on Virtual Conferences¹⁵.

There was also some discussion about how to organize a follow-up poll for participants. This poll was performed and published online¹⁶. To summarize the essential points, it was completed by 114 participants (42% of the registered participants). The outcome was that the online conference was perceived as comparable but somewhat worse than a typical on-site edition, but much better than what had been expected. Further, 72% of respondents supported the idea of hybrid conferences as a way to reduce CO2 emissions (with only 10% against), and 52% supported the idea of alternating physical and virtual conferences for the same purpose (with 26% against).

In terms of addressing the climate crisis by our research, one proposed research direction was to explore less compute-intensive machine-learning algorithms.

4 RECOMMENDATIONS

As organizers of the EDBT/ICDT 2020 climate change session, and based on the discussion during and after the session and on the follow-up survey, the authors of this document make the following recommendations to the EDBT Executive Committee and ICDT Council.

- (1) **Desiderata.** There is a pressing need to move to more sustainable models of holding conferences, which also brings other advantages:
 - (a) being more resilient against travel restrictions such as the ones caused by the COVID-19 pandemic;
 - (b) being open to a more diverse array of participants, especially those who cannot travel because of family commitments, personal reasons;

¹⁰URL: https://events.ccc.de/congress/2019/wiki/index.php/Congress_Everywhere

¹¹URL: <https://writefreely.debian.social/paddatraper/remote-conference-software>

¹²URL: <https://medium.com/@kording/how-to-run-big-neuro-science-conferences-online-neuromatch-io-49c694c7e65d>

¹³URL: <https://elifembassadors.github.io/improving-conferences/>

¹⁴URL: <https://cacm.acm.org/blogs/blog-cacm/243882-the-asplos-2020-online-conference-experience/fulltext>

¹⁵URL: <https://www.acm.org/virtual-conferences>

¹⁶URL: <https://arxiv.org/abs/2004.07668>

(c) having flexibility to experiment with other formats for the event (in-depth discussion on Slack, archived video talks, etc.).

Based on the EDBT/ICDT 2020 report, a large majority of participants (72% of 112 respondents) favor a hybrid conference model, with more limited support (52%) for a model where physical and virtual meetings would alternate. Based on this, we recommend to adopt a hybrid conference model for EDBT/ICDT going forward.

- (2) **TCS4F Manifesto.** To give a clear direction to this new model in terms of limiting carbon emissions and travel, we recommend that the EDBT/ICDT conference signs the TCS4F manifesto to commit to a 50% reduction of its greenhouse gas emissions by 2030 relative to pre-2020 levels.
- (3) **Climate Chair.** As part of the organization of the EDBT/ICDT conference every year, a Climate Chair should be appointed. The Climate Chair would be part of the local organization and consult directly with the General Chair. The Climate Chair would be responsible for the following:
 - (a) estimating the carbon impact of the conference, in particular making it public to participants at the conference and summarizing it in the proceedings;
 - (b) advising the organization on ways to reduce the carbon impact of the conference, including meals and menus (including vegetarian dishes), dishware, local transportation, excursions, promotional items, etc., balancing this with the objectives of the conference and the expectations of the conference;
 - (c) aggregating information about indirect emissions such as the travel emissions of conference participants when traveling to and from the conference venue;
 - (d) exploring options and providers for CO₂ offsetting;
 - (e) monitoring compliance with multi-year reduction objectives (such as TCS4F);
 - (f) organizing community discussions about climate change, e.g., as follow-up events to the climate change session.
- (4) **Registration and carbon offsets.** When on-site EDBT/ICDT participants register, they should be asked to self-report how they will travel to and from the conference venue (transportation means and distance). The corresponding CO₂ emissions should then be estimated, to make participants aware of the impact of their travel. Participants should then be encouraged to include in their conference registration fee the price of offsetting the corresponding emissions, hopefully in a way that universities will be ready to reimburse. Alternatively, reductions in fees (e.g., for participants traveling by train rather than by plane) could be proposed. The data collected about these emissions should be used to estimate the indirect emissions of the conference, and be made available in anonymized form to enable further analysis.
- (5) **Fees.** The registration fees should be different for on-site participants and remote participants. Remote participation should not be free, so as to cover the costs that it induces (e.g., service fees for hosting providers like Zoom, costs of professional video capture, equipment, online-offline social engagement, etc.). However, as much material as possible should be made available for free online,

e.g., videos of talks, live streaming on platforms with no additional fees (such as Youtube live), access to text-based online discussion boards (e.g., Mattermost or Slack), etc.

(6) **Hybrid conference model.** There are multiple ways to host a hybrid event. Without dictating the specifics of how such an event should be organized, here are two broad proposals of possible models:

- (a) On-site event in a single hub, but with high-quality remote participation:
 - (i) participants can attend the event on-site at the conference venue, or remotely;
 - (ii) all sessions should be streamed live to remote participants, if possible using professional equipment and services;
 - (iii) paper talks can also be given remotely, in streaming or as pre-recorded videos;
 - (iv) remote participants can ask questions, by video or by text;
 - (v) social events, coffee breaks, etc., have an analogue for online participants (e.g., with a platform like gather.town);
 - (vi) there is a text-based online discussion (e.g., Slack) available to both on-site and remote participants;
 - (vii) more experimentally, there could be hybrid social events featuring an in-person and an online component, e.g., have screens with remote participants talking with in-person participants, or have “matchmaking” or “speed dating” opportunities where participants would make appointments to have an informal chat online with specific people.
- (b) On-site event in multiple physical hubs, plus remote participation:
 - (i) the event happens online, but participants are encouraged to regroup in a “hub” to attend it together;
 - (ii) hubs can have several sizes, from very informal sites at the level of a research lab, to sites featuring social activities for a large number of participants for multiple countries (similarly to an official conference venue but for a subset of the participants);
 - (iii) a call for hubs could be organized, similarly to calls to select the next physical venue of a conference, but allowing multiple hubs instead of just one single site;
 - (iv) participants can attend the event on-site by registering at a hub of their choice, or attend remotely;
 - (v) to facilitate the organization, it may be more convenient to designate one of the hubs as a leader and being in charge of coordinating the logistics across hubs.

(7) **Green research.** We do not contest that EDBT/ICDT does not specifically focus on climate change and other environmental issues. However, we believe that the expertise of our communities, applied to the right problems, can offer useful insights and have significant impact on these issues. For this reason, we recommend to encourage the submission of papers that help with addressing environmental issues and climate change. This could take the form of an allocation of papers in the

research, demo, application/industry tracks, or a “green” label or special “best green paper award” at EDBT/ICDT. This encouragement should be advertised on the call for papers.

- (8) **Updating the EDBT/ICDT guidelines.** The EDBT/ICDT guidelines document, which specifies how the conference is organized, should be updated to reflect any change in the conference modalities.

We encourage the EDBT Executive Committee and ICDT Council to investigate these issues, in time for the upcoming edition of EDBT/ICDT, while keeping in mind the prospects for future editions. While the most pressing concerns are understandably the immediate issues caused by the pandemic, we believe that the ongoing efforts to re-think conference organization should also serve long-term goals for our conference to adapt to the climate crisis.