

TCS ON THE WEB

BY

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TCS+¹ is an online seminar series in theoretical computer science, existing since 2013, and by now there have been almost 200 talks. The seminar consists of online talks about the most important new results in algorithms and complexity, and also makes the talks available on YouTube². Digging through the TCS+ YouTube channel is a real treasure trove of great talks and highly influential results of the past decade.

Recently, there have been a few changes to TCS+. Some of the time slots of the talks have been adjusted to better suit European audiences. Now, the talks usually commence at either 16:30 and 19:00 CET, and after the talks, there are more open discussions with the speaker.

Today I am more than happy to talk to two of the current TCS+ organizers, Rachel Cummings (Columbia University) and Sumegha Garg (Rutgers University). The other current organizers are Clément Canonne (University of Sydney), Shivam Nadimpalli (MIT), Yasamin Nazari (VU Amsterdam), and Erik Waingarten (University of Pennsylvania).

¹<https://sites.google.com/view/tcsplus/welcome>

²<https://www.youtube.com/@TCSplusSeminars>

BEHIND THE SCENES OF TCS+: TALKS, RESEARCH, AND COMMUNITY EFFORTS

A Conversation with Rachel Cummings and Sumegha Garg

Rachel and Sumegha, thank you for taking time for this interview. I think TCS+ is a great format that a lot of people in the community appreciate due to its timely and interesting topics. How do you decide which results you want to cover in TCS+ talks? Do you bias towards big new results or towards very active areas?

Rachel: We have a web form¹ where anyone can suggest papers, and we encourage people to use it—we'd love to get more suggestions! Organizers also add their own recommendations. We gather all the suggestions into a list and vote on them. We do have a bias towards topics that would be of broader interest rather than specific niche topics.

Sumegha: Exactly. The diversity of our organizing team also helps. Since we come from different research areas, we can make sure our selections appeal to a wide range of people. If a talk gets votes from across the team, it's usually a good sign it'll resonate broadly. We also keep an eye on accepted papers at recent theory conferences to identify impactful papers that haven't yet been suggested.

Rachel: Another factor is the speaker. We prioritize speakers known to give high-quality, engaging talks because that makes a huge difference, especially in an online format. If no one on the team has seen a speaker before, we'll check their previous talks online to make sure they'll connect well with the audience.

TCS+ has been around since 2013, long before the pandemic forced us all into online talks. What's changed over the years?

Rachel: Oh, a lot! I remember attending TCS+ talks as a grad student. Back then, it was hosted on Google+, which is where the "+" in TCS+ comes from. Google+ was like an early version of Zoom, but without as many features.

Sumegha: Right, and only 10–12 people could join a session because of platform limitations. So universities would organize watch parties in their conference rooms. Groups would gather, project the talk onto a screen, and watch together.

¹<https://sites.google.com/view/tcsplus/welcome/suggest-a-talk>

Rachel: I have really fond memories of that era. I was a student at Caltech then, and the talks were in the morning for our timezone. We'd meet in a conference room, bring coffee and bagels, and watch the talks as a group. It felt special—a mix of learning and community building. But it was also competitive! Since only a few schools could join, there was a waitlist. If your school couldn't make it one week, another would take your slot.

Sumegha: Things are much more open now with Zoom. Anyone can join, which is great for accessibility. But we don't see as many of those group watch parties anymore, which is a bit nostalgic.

Rachel: We also upload all of our talks on YouTube² and so that people can watch them any time. Even if live attendance on Zoom has dipped, we get hundreds of views within a day of posting a new talk on YouTube.

It sounds like the format has evolved a lot. Have there been any challenges?

Sumegha: Definitely. During the pandemic, participation was high, but later, we noticed Zoom fatigue setting in. To address this, we've started encouraging more interactive discussions after the talks, which aren't recorded. It helps bring back some of that personal engagement.

Rachel: We've also adjusted the timing of some talks to make them more accessible to European audiences. Traditionally, our talks were in the evening for Europe, which isn't always convenient. Now we alternate between our usual time and an earlier slot to accommodate more people. The early talks start at 16:30 CET.

How did you both get involved in organizing TCS+?

Sumegha: I joined in 2020. I got an email from one of the organizers, and I was really excited to see how everything worked behind the scenes. At first, I focused on backend tasks, but over time, I became more involved in planning and organizing talks.

Rachel: For me, it was around 2021. Organizers are invited based on their reliability and expertise, and we try to ensure a good mix of research areas. People rotate in and out, depending on their availability, which keeps the team dynamic and diverse.

TCS+ is aimed at a technical audience. Do you see opportunities to engage broader communities, like applied researchers or mathematicians?

Rachel: Absolutely. Admittedly, TCS+ does focus on the TCS community, as our talks are really aimed at that audience. There's tremendous value in interdisciplinary engagement across academic communities or with practitioners, as

²<https://www.youtube.com/@TCSplusSeminars>

we've seen in the EconCS and CS+Law communities. Engaging broader audiences can help facilitate these connections, but requires a different approach. For example, talks should use less technical jargon and provide more background in order to be accessible to a broader audience who may be working with a different professional vocabulary.

Sumegha: Even within TCS, we try to make talks accessible. For example, we include one or two survey talks each semester, which are more about teaching a topic than presenting the latest advances. It's a way to help researchers learn about areas outside their specialization.

Can you tell us a bit about your research?

Rachel: My work focuses on differential privacy, which is a method for protecting individual privacy in data analysis. The goal is to ensure that changing one person's data in a dataset doesn't significantly alter the results. This usually involves adding random noise to the process.

I have two main areas of focus. On the theoretical side, I design and analyze privacy-preserving algorithms for tasks like optimization and statistics. On the practical side, I think about how to implement these algorithms in real-world settings. This includes translating complex privacy parameters into terms organizations care about, like compliance or risk mitigation, and communicating the privacy guarantees to end users.

Sumegha: My background is in computational complexity theory. I study models of computation with memory or information constraints, such as streaming algorithms or distributed computing. Recently, I've been exploring how memory limitations affect learning or estimation tasks, like online learning or regret minimization. Understanding the memory requirements of these tasks is becoming theoretically and practically important.

Any final thoughts you would like to share with our readers?

Rachel: We'd love to see more people attend talks and suggest topics for TCS+! Engagement is key to keeping this format alive and relevant.

Sumegha: Yes, please use our web form³ to suggest speakers or topics you're excited about. It's a great way to make sure the talks reflect what the community cares about.

Thank you for this nice interview, Rachel and Sumegha!

³<https://sites.google.com/view/tcsplus/welcome/suggest-a-talk>