CPCI Activity Report 2018–2019

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This report summarizes the activities of the CPCI association over the year 2018–2019. The CPCI association is a French non-profit (RNA identifier W751238568), whose mission statement is to promote competitive programming. The focus of CPCI's activities in 2018–2019 was to organize the SWERC'18 programming contest.

The contest. SWERC is a 5-hour on-site programming contest for teams of three students, focused on algorithmic problem solving and practical coding. It is open to teams from France, Israel, Italy, Portugal, Spain and Switzerland. SWERC serves as the regional selection phase for the International Collegiate Programming Contest[1]: the winning teams of SWERC are qualified to advance to the ICPC World Finals and compete against teams from all over the world.

In 2018, SWERC was co-organized by École normale supérieure[2] and Télécom Paris-Tech[3] and managed by the CPCI association. It is a regional ICPC contest but is organized rather independently, although we received financial support from the ICPC Europe Sponsor Huawei thanks to the help of the ICPC Director of Development, Veronika Soboleva. The structure, rules, and regulations of SWERC also follow the ICPC regulations. SWERC was hosted by Télécom ParisTech, who contributed financially to the contest, but also contributed in kind, by providing the location and computer rooms, and by offering us the help of its staff (IT, logistics, communication, security, mail, electricity, etc.).

Participants. SWERC has taken place in Télécom ParisTech on December 1–2, 2018. The number of teams of three students who were admitted at the contest was 89 (up from 76 last year), the highest number of teams ever at SWERC; this number was higher than our original planned capacity of 85, and allowed us to accommodate all teams who applied, subject to the limit of admitting at most 3 teams per institution. Of these 267 contestants, all were physically present at SWERC and participated to the contest from the beginning to the end.

These 76 teams came from 49 universities (up from 48 last year). We have published[4] a complete list of the teams, including a map, and including the name and contact

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[1] https://icpc.baylor.edu/
[2] https://www.ens.fr/
[3] https://www.telecom-paristech.fr/
[4] https://swerc.eu/2018/teams/

informations of team member and coaches who wished us to publish this information. We also posted online the past results of these institutions at previous SWERC contests[5].

In addition to the 267 contestants, we also welcomed coaches from these institutions: 64 coaches and co-coaches registered to attend the event, although not all of them were physically present. We also welcomed around 15 guests, including the Télécom ParisTech director Yves Poilane, the director of the Computer science and networking department at Télécom ParisTech Gérard Memmi, the ICPC Director of development Veronika Soboleva, and representatives from our sponsors Huawei, Lokad, Systran, and Facebook.

In terms of organizers, the team was led by the contest director, contest deputy director, and chief judge. It comprised 10 judges (who also acted as problem setters), and 34 registered volunteers. The team also included 2 engineers from the Télécom IT department. Overall, we prepared 406 nominative badges (up from 355 last year). There were other participants without a badge: Télécom security and canteen staff, and members of the Télécom student association Comète for photo and video coverage.

Activities. The registration process was handled by volunteers, and included the distribution of prepared badges to the contestant teams, the collection of their notebooks and dictionaries (for verification by the judges and installation in the labs), the distribution of contest bags to participants (including a badge holder, t-shirt, notebook, pen, information leaflet, and promotional information from sponsors); last, Comète took a picture of most participating teams in front of the contest banner (for some teams we had to take a picture in the lab because we did not have the time to use the banner. This year, Veronika Soboleva gave to contestants a form to give their information to ICPC in case they were interested in recruitment opportunities.

The event started with an opening ceremony, which summarized some general points and statistics, and included an opening talk by Gérard Memmi (director of the Computer science and networking department at Télécom ParisTech) and Veronika Soboleva (ICPC Director of development). We continued with a talk by Europe sponsor Huawei, and, after the coffee break, by talks by our two gold sponsors Lokad and Systran. We then gave an introductory talk to the practice session, followed by lunch at the Télécom canteen.

The practice session was the opportunity for contestants to get acquainted with the contest environment. This year, we faced an unexpected problem during the practice session, as a majority of participant computers locked up simultaneously, approximately 15 minutes into the practice session. This incident was handled by phoning our IT contact at Télécom ParisTech, who was able to trace the problem to a crash of the NFS server that provides the remote storage for contestant machines. At that point, we restarted all affected machines, sometimes resetting the contestant data. It was then determined by our IT that the crash had been caused by a spike in NFS usage from a computation server (Titan from the COMELEC department). The issue was mitigated by throttling the traffic from this server for the rest of the weekend, and agreeing with our

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[5]https://swerc.eu/2018/past-editions/

IT staff to monitor the NFS load throughout the contest on Sunday to react promptly if the problem recurred. We also performed after the practice session a stress test of the NFS infrastructure by asking all contestant VMs to write 2 GB to disk simultaneously: this did not cause an anomalous load of the NFS server.

Because of this issue, we had to delay the admittance of coaches to the contest floor while the problem was being fixed. There was also limited opportunity for teams to request changes to the contest environment: one team complained about the support of C++ version 2014 in Eclipse Oxygen, which we were unable to reproduce. One team complained about the fact that the C++ plugin was missing from the newer version of Netbeans that we had installed; we were unable to fix this but at their request we installed the Qt C++ IDE.

Following contestant feedback, the contest banquet this year took place closer to Télécom and started one hour earlier. It was held at the Paris Marriott Rive Gauche Hotel & Conference Center. Like last year, there was a fixed seating assignment designed to ensure that contestants would meet people from outside their team. We provided a construction set (Técap wooden planks) to each table and tasked our sponsors with evaluating what was built by contestants during the dinner.

On Sunday, we started by giving some last minute information about the contest, to point out the changes that we had made to the contest environment, and reassure contestants that the NFS issue was under control. The contest then took place from 9:00 to 14:00: the team of volunteers provided snacks, supervised the rooms, and delivered balloons and printouts. One additional computer room was opened in comparison to last year, down one flight of stairs from the rest of the labs. While the load of the NFS server increased in the first seconds of the competition, there was no problem with the server this time, and no technical issues except the crash of one team computer (which was successfully restarted) and a water leak from the ceiling of one of the labs which affected one team during the last hour of the contest.

Contestant submissions were reviewed by the team of judges, who had prepared the problems and were all physically present. The contest control system (DomJudge) was managed by the chief judge, while the contest director was in charge of the contest environment. A copy of the contest environment (virtual machine image) had been made available for download before the contest[6], and a publicly available instance of the contest control system was also made available during the contest for coaches and other interested parties: there were 28 users who made submissions using this system, including 13 coaches and 15 self-registered participants.

During the contest, the director and deputy director had a meeting with coaches to discuss about the future of SWERC. After the contest, we had a lunch break. We then had a problem analysis session, where the judges briefly presented their problems and possible solutions, and an award ceremony where we announced the results, congratulated the winning teams, handed out prizes, and said a few words of thanks. The event concluded by the delivery of the team certificates, with the issue that some team certificates were found to be missing.

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[6]https://swerc.eu/2018/environment/

Results and communication. The rankings of the contest are available online[7]. The contest was won by team "ENS Ulm 1" from École normale supérieure (Paris), with 10 problems solved; the runner-ups were "Team RaclETH" from ETH Zürich, with 9 problems solved, and "UPC-1" from Universitat Politècnica de Catalunya, with 9 problems solved.

We gave out 2 gold medals, 4 silver medals, and 8 bronze medals. All medal winners received gifts from Huawei (though bronze medal winners only received a voucher as a delivery problem prevented Huawei from presenting them with their gifts on-site). Gold medalists also received gifts from Facebook. Last, this year, the SWERC winners were awarded a trophy, to be returned to SWERC next year so that it can be passed on to the next winners.

The problem set for the SWERC 2018 contest and for the practice contest have been published online[8].

Assessment. Overall, we believe that CPCI has successfully ran the 2018 edition of SWERC. The number of 89 participant teams is a 17% increase relative to last year, a two-fold increase relative to 2013. One point which is less encouraging is that the number of participating institutions has only increased by one (from 48 to 49 institutions). Of these institutions, 38 were here last year, 6 were coming back after some time, and 5 were participating for the first time; but this also means that some institutions did not renew their participation from last year. Like last year, we have made extensive efforts to reach out to institutions and encourage them to participate: we used our existing professional contacts, the contact information of former participants, and we also cold-emailed some institutions (through which we managed to attract at least two new participants).

One important point this year was the malfunction of the contest environment during the practice session. Thanks to the help of the Télécom IT, we were fortunately able to identify the cause and mitigate it, so that the contest could run as planned. However, this was still quite worrying and suggests that it would have been preferable to have a more redundant setup in place for the team workstation infrastructure, e.g., one failover NFS server.

Other than that, we are not aware of any serious problem with the contest environment, hardware, contest control system, or judging infrastructure, that would have jeopardized the fairness of the contest. There are no incidents with participant behavior that need to be reported. Overall, we believe that SWERC has adequately performed its core task of identifying the best teams to promote to the ICPC world finals.

As for the rest of the event, we believe that the catering for lunches using the Télécom canteen worked better than last year, as it ensured that all contestants had their own meal with enough food. The banquet this year also worked well, in our opinion, and we believe that the assigned seating and construction set were a great way to break the ice and create a friendly atmosphere.

One last point of concern is that we have not been able to settle at this time the

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[7]https://swerc.eu/2018/scoreboard
[8]https://swerc.eu/2018/problems/

question of where SWERC'19 would be organized. We have sent out a call for bids to organize SWERC'19 in March 2018, we have renewed it multiple times, and we have raised the issue again during the coach meeting, but at this time there have been no formal bids in answer to this call.

Sponsors. SWERC was co-organized by Télécom ParisTech and by École normale supérieure. It was supported by ICPC Europe sponsor Huawei; by our gold sponsors Lokad+CoinGeek+nChain and Systran; by our silver sponsors Almerys, Facebook, the Région Île-de-France and Télécom ParisTech; and by our bronze sponsors Criteo labs and Inria. We also acknowledge the World Finals Sponsor Jetbrains. We are also grateful to all Télécom staff members who have supported this endeavor. Last, we are extremely grateful to the judges, volunteers, and everyone who helped make SWERC possible.

A registration fee of 150 EUR was requested from each participating team (3 students plus one or several coaches, for all activities). This is slightly higher than last year's 120 EUR registration fee as we did not know how much sponsoring we would receive until a few weeks before the competition. We offered to waive the fee for teams that were not supported by their own institutions, but no teams applied for this waiver in the end.