Q1. Please write a paragraph about how you became excited about computer science, computer engineering and/or a closely related technical field. How did this lead you to major in the field and what do you hope to accomplish with your degree? (128 words)

I started early with simple computer courses since primary school then participated in International Informatics Olympiad in high school till national level. At the time of choosing engineering stream after my +2, I selected Computer Science branch out of my passion for CS.
From the first year itself, I participated in hackathons by Microsoft Code-Fundoo and by GDG- Geek Girls, WoW & OSDG - Hyderabad and many others. Our team of four won special prize for No crimes, a crime reporting app. It gives instant access to nearby police-station and NGO's records. The full information about the crimes reported in a particular area can be easily seen in the application. Its other features include signing of petitions for the registered complaints, monitoring the working of police departments and the NGOs.
After the 2nd year, I heard that google funds some selected organization projects and gives stipends to student developers under the Google Summer of Code program. I participated and got selected for Peace Corps Photo Language Translation project in Systers community. This project helps in learning languages that have no written script like Chuukese. During this program, I learnt many things from my mentors - Rose Robinson, Ana Cutillas, Sylvain Abelard and Pamela Vickers and also wrote blogs to share my learnings with my fellow CS enthusiasts. (Link)
After its successful completion, I took part in various mentoring programs as mentioned in third essay question. I also got the opportunity to attend Google I/O conference at San Francisco in 2015 and interned at HackerRank, Bangalore the same year.
I also had interest in sciences since intermediate and thinking on how computers can be useful to scientists gave me a problem to solve for my Masters in Computational Natural Sciences. I have successfully published a paper as the first author in Theoretical Chemistry Accounts journal with impact factor 2.233
Citation - Gurtu, Saumya, et al. "Ability of density functional theory methods to accurately model the reaction energy pathways of the oxidation of CO on gold cluster: A benchmark study." Theoretical Chemistry Accounts 135.4 (2016): 1-12
I love to ease out problems of practical life using computers and in this way I continue to work in the computer science field and challenge myself by solving new problems that interest me.

Q2. Please describe the challenges you have experienced or observed as a woman in computer science, computer engineering and/or a closely related technical field. (256 words)

Women in tech are hugely underrepresented, and that is no secret. I feel that gender is not a variable on one's ability with computers and technology, and I am now actively encouraging women to feel similarly comfortable in active participation in coding, whilst creating a community where both genders are able to work together.

Sexual harassment, gender biases and stereotypes like “boys just like computers more” or if something goes wrong then “it must be the fault of a woman worker because men can never do anything wrong”, etc. make working difficult for women in such environment.
Working mothers face difficulties in managing their children with their work. Some essentials for women if available can make little worries go away from work desk for women.
I want to be part of the movement that helps remove gender biases, and truly believe these methods can bring a huge leap closer to letting men and women everywhere release their inner geek and work together equally.

Q3. Please write about an activity that you are currently or recently involved in to encourage or support women in computer science, computer engineering and/or closely related technical fields. Explain how you demonstrate leadership in your role in that activity, and what you are trying to achieve. If you have been involved in multiple activities, please list them all, then choose the most impactful to discuss in detail. (512 words)

After the successful completion of my GSoC 2014, I volunteered to make learning tasks for Ruby on Rails for GHC workshop 2014 attendees (which is approx. 4500 attendees). I fully committed myself to the project that I took in GSoC 2014 (Link) & continue to mentor the two student developers in GSoC program every year since then (Link). This year I am also working as a coach for Rails Girls Summer of Code team of 2. (Link)
I believe that it is important for coaches to teach the process of programming - showing the way to a solution rather than telling the answer. This sometimes includes going over the basics, showing how to debug and troubleshoot, or discussing concepts on paper. I spend time with the students in front of the screen, guiding them through the relevant coding steps (eg. by asking mindful questions) and keep a check on project progress with respect to timeline because timely code delivery is very important.
Since every project is different; and I need to make sure that our students really understand what I am trying to teach them. I try to be available via chat or email, for important/urgent matters too. I always try to keep the discussion mode so that the learning takes place both ways.
Mentoring also helps in learning project and team management. This management gets tough when we have a team of people from different time zones like I had in GSoC 2014 and 2015. Just like my mentors taught me, I also teach student developers to make a doable timeline, documentation and tests for the project. I try to do this for all the submitted applications for GSoC (approx. 12 every year for my project) and the response I get from students after helping them is overwhelming. This happiness keeps me going.
The most important task that comes first before the actual mentoring starts is selecting the right candidate for the program like GSoC just by reading the proposal and a few message exchanges. This requires a lot of experience.
Despite the difficulties, I love to mentor student developers in various programs because in that way I will be giving back to the community for a great cause: by empowering women to contribute to open source. It's a great way to share my knowledge. I also believe that coaching can be really rewarding for your own work, that it can improve the way you write code and help you grow as a developer, as well as strengthen

your concepts. And above all, an overwhelming buzz looking into the happy faces of your student developers when they succeed.

Q4. If you had the resources of a company like Google, describe the ideas you have to increase the involvement and/or improve the experiences of women in computer science, computer engineering and/or closely related technical fields. (128 words)

Giving away travel grants for underprivileged group, discounted registration for conferences, various awards and scholarships for excelling in their field of work or for mentoring a large group of women and encouraging them to code, etc. would be good incentives to reward working women, give more opportunities for working women, and attract new women in this field. Since many speakers and attendees attend conferences, it's a great opportunity to connect with other women in computing and innovative organizations, hear stories from peers and experts and get quality career advice specific to the needs. Awards for technical women whose lifetime contributions have significantly impacted the landscape of technological innovation and whose legacies continue to inspire generations of young women to pursue computing and make history in their own right and awards for entrepreneurial heroes among women should be given. Anita Borg Institute and its Systers community has been providing these facilities for years which gives exposure to many young women in this field. Many such successful examples include Anita Borg Scholarship, Red Hat Open Source Developer Award, Grace Hopper Celebrations attended by approximately 45,000 women, etc. and eventually get more women in positions of power and control in the industry. From here, women can become role models for younger girls more easily.

Other options can be organising hackathons for women, hands on workshops for various skills that women want to learn. Organising programs where girls are given stipend to work on open source projects like Rails Girls Summer of Code, Outreach program for women, etc. also boost number of women participants in computer science field.

It would be great if the women essentials are provided at the offices, conferences and events, some essentials for pregnant women and some for women with their children and a play area for children. This would make their working environment more comfortable and they can work without worrying about other things. Women Techmakers community tries to provide all these facilities to women at events which is great.

We can celebrate a day designed to recognize women for their achievements without regard to national, ethnic, linguistic, cultural, economic, or political divisions and an occasion for looking back on past struggles and accomplishments, and more importantly, looking ahead to the untapped potential and opportunities that await future generations of women.

I have been using the tool of blogging to share my experiences about different events and programs, like what I learnt during GSoC 2014 (Link). This has been an incredible way to increase number of female participants for GSoC next year. I also talk to my juniors in my University, and some of the female professors on how we can encourage more women to attend more conferences and engage more in coding.

Q5. (Optional) If you're doing a research degree, please attach a paper or research proposal of yours that most accurately represents your research.

Ability of Density Functional Theory Methods to Accurately Model the Reaction Energy Pathways of the Oxidation of CO on Gold Cluster: A Benchmark Study

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Gold clusters are currently regarded as new generation catalysts owing to their exceptional efficiency in accelerating several classes of reactions. Density functional theory (DFT) is the method of choice for the investigation of energy pathways of reactions assisted by metal nanoparticles due to their computational efficiency. However, the reliability of such theoretical studies depends to a large extent on the choice of the DFT functional used. In the present work, the performance of a series of DFT based functionals to accurately model the prototypical CO oxidation reaction catalyzed by a Au_3 cluster has been examined by comparing the results with those obtained from high level ab initio CCSD(T) method. This comparison study has been carried along the two possible pathways (Eley–Rideal (ER) and the Langmuir–Hinshelwood (LH)). No significant differences among the DFT functionals were observed in terms of obtaining the geometries of stationary points including the transition states with minor exceptions. However, the adsorption energies, barrier heights and reaction energies calculated using the DFT methods lie in a wide range with some methods showing high deviations from the CCSD(T) results. Our calculations suggest that the adsorption energy values are sensitive to the inclusion of long range correction and dispersion correction, whereas the barrier heights do not show much dependence on the inclusion of dispersion effects. The percentage of Hartree-Fock exchange included in the DFT functional also plays a crucial role in predicting the correct pathway. Based on this extensive benchmark study, it is suggested that the computationally less expensive hybrid density functionals, PBE0, B3PW91 and B3P86, are better suited for accurate modeling of this class of reactions.

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Link - http://link.springer.com/article/10.1007/s00214-016-1852-6