Letter of Motivation

If I had to sum-up the whole letter of motivation in one sentence then the sentence would be this: "Computers and the world of binary fascinate me more than anything else in the world, and if I had the option to do anything in my life without any constraint for survival, it would be to understand them better, to be able to use the power that they bestow upon us to change the world, no matter how small a contribution I could make."

I have been at a point in life where I was hopeless and thought there was no way for a normal kid like me to be able to make any tangible contribution to this world, and that changed the moment I saw the potential of these devices. I understood that I didn't need to be the chief executive officer of some company or some politician to bring about change. I could just pick up my laptop, sit on my couch and code for different open source organisations to make a change, and this thought was more liberating and hope inducing than any other I have had in my life. The possibilities are endless. That hope is what drives me.

I have a general inclination and interest in how computers function, and hence I have developed a liking for areas like data storage, computer architecture and operating systems. I recently was fortunate enough to be able to write a review paper on DNA based storage; a technology that might drive the future of computer storage as we know it. I discussed the problems caused due to the exponential growth in the amount of data being created due to the rise of big data and how the improvement in storage technologies is not able to keep up with this growth. I mention how DNA based storage could be the solution to all of this due to its extremely high density, and robust nature, among many other reasons. I also had the chance to highlight the issues and the future work to be done in this field. Other than being a great experience in being able to write about something I adore, it was a wonderful chance to learn how to read research papers and to be able to learn from them. I learned to work under pressure of deadlines and under the supervision of a professor in college which was a life changing experience on its own. I am also pursuing a project based course where we get to design a computer from the ground up constituting the hardware configuration, assembly and software to better understand how computers work and how abstraction is one of the strongest concepts in computer science.

Even though I am attracted to multiple aspects in computer science and that would be true for all computer lovers out there, but out of all possible possibilities, the one that I am most attracted to is to the use of Machine Learning and Deep Learning in two fields i.e. Natural Language Processing and Autonomous Vehicles. I am currently working on both as part of different projects.

For natural language processing, I am currently interning at the Lab for Computational Social Systems at IIITD, New Delhi working on collusive social networks. I am part of a team, analysing the pattern of activity of collusive users in social networks like Twitter where a user could request for certain retweets from a syndicate where a group of users agree to retweet your tweet in return for you to retweet someone else's (generally someone unknown) tweet. Retweets drive a topic to be trending on social networks and these activities can lead to anti-social activities becoming trending leading to tensions between different communities in the society. Being able to detect such activities allows us to stop such tensions and hence promote peace in the society.

I am also part of another project called the Autonomous Rover Embedded Systems Robotics, which has a goal to develop an autonomous rover from the ground up which would be the official entry of the university in the University Rover Challenge and the European Rover Challenge to which the team qualified as one of the top 70 teams around the world last year. I am currently leading the research in the software team where we are finding ways to use computer vision assisted by convolutional neural networks and recurrent neural networks and Simultaneous Localisation and Mapping algorithms to be able to autonomously traverse foreign conditions where accumulating knowledge about the field is not possible or less efficient. I am leading a team of 10 developers in this pursuit and am confident that we would be able to do better than we did last year.

I am looking for opportunities to increase my knowledge and skillset in multiple domains of Natural Language Processing, Computer Vision and Machine Learning in general, and that is where this internship opportunity comes into the picture. I hope to work on different problems found fit for me to work on, which can augment my knowledge in the mentioned fields. I hope to get a chance to combine my current work which would hopefully be at a much more mature stage with what I can accomplish at EPFL under the guidance of a professor who might see any hope in me. I see this as the perfect opportunity to be able to spend quality time with some like minded people to be able to work on problems that help increase our understanding of what machines can do. This seems as the most logical step in this journey I hope to take understanding this wonderful world of computers. This opportunity seems to be the perfect experience where I get the chance to come out of my comfort zone to see how good I really am and to understand whether the hope I derive everyday from this field holds any value or not.