Study Abroad Personal Essay:

Exploring the world outside of the United States has long been an unfulfilled dream of mine. I was not raised in a particularly wealthy family, so we never had the kind of money to afford a costly trip across the Atlantic Ocean to Europe and beyond. Even if we did, a typical European vacation might not really expose you to the true local cultures. Rather, you could end up swept up in tourist targeted activities which sell you an imagined and romanticized vision of the local culture. This is an experience that I do not consider a successful vacation. Now, as a rising junior at Caltech, I have been presented for the first time with a chance at an authentic experience of another culture with the study abroad program, and it is truly exciting for me.

The allure of travelling to unique communities around the world has appealed to me more strongly than ever in the past few years. Coming to school in California was the first time I have ever lived outside of my hometown of Albuquerque, New Mexico. While going to an unknown place was scary at first, I soon found a second home here in Pasadena. It has highlighted to me the differences in culture that one experiences simply living somewhere new. California is bustling and crowded with a vibrant economy and an incredible diversity in backgrounds, wealth, and local culture. This is in contrast to New Mexico, a state with a distinct experience strongly influenced by the large Mexican population. The differences have made me appreciate many aspects of both places and has highlighted qualities that I would have never noticed. Thus, I want to continue experiencing new cultures and do so in somewhere with even more noticeable differences. That is the opportunity that study abroad presents. I would be able to live and truly immerse myself in a once-in-a-lifetime college experience outside of the United States. This would bring me great personal enrichment in highlighting qualities of my life that I may not be previously aware of. It will put my life in perspective and introduce me to new friends and lifelong memories.

Beyond personal enrichment, studying abroad will also advance my academic experience. Caltech is truly a wonderful school, but the method of teaching is very distinctive and has both its benefits and downsides. Getting to learn in a totally new environment will allow me to appreciate different methods of teaching and broaden my understanding of education. I fully expect to get an equally rigorous and intense education outside of Caltech, but the approach to learning will be different and will actually strengthen my overall academic profile.

Study abroad presents a truly unique opportunity for incredible experiences beyond the confines of the North American continent. I anticipate that it would be truly beneficial in both personal and academic measures, and I greatly appreciate the consideration of my application.

Cambridge program fit:

The study abroad program at Cambridge is strongly appealing to me. I know the courses will be taught at the highest level with great rigor. The school has incredible historical significance and is one of the most important universities in the world. There is more variety in courses offered compared with Caltech within the computer science tripos and I plan on taking certain courses such as quantum computing (Michaelmas) which has been made accessible to computer scientists or E-commerce (Lent) which is simply not offered at Caltech. I particularly look forward to the supervisions, as the personal attention in learning is difficult to achieve here. In addition, I believe the college system will help me find a good community to call my home in England. The college system seems to be a larger and more elegant version of the housing system at Caltech, which helps break larger communities down into more manageable sizes. I will also appreciate getting exposed to a crowd of people with more diverse interests and worldviews, as well as experiencing the many historical traditions of Cambridge.

Edinburgh program fit:

The University of Edinburgh offers some exciting opportunities that for courses and experiences that I could not find at Caltech. I would look forward to taking courses such as Computational Cognitive Science, a course for which there is no real match here. In addition, I have the opportunity to take more rigorous humanities courses, such as Human Geography. Not only are these kind of courses not offered here, but there is not the same level of rigor in the humanities as you could find at a true university like Edinburgh. Further, the personal experience of living in a flat in Edinburgh will bring me many new enriching experiences. Exploring Scotland and Europe will help me appreciate diversity in cultures and put my life in America into perspective.

Cambridge Lent Term Course List:
Total CIT Units for term abroad: 39

Course by Correspondence/Units:
Compiler Construction: CS 131   9 units
E-Commerce: 3 units
Computer Networking: CS/EE 145   9 units
Computer Vision: CS/EE/ME 134   9 units
Cryptography: CS 152   9 units

1. Compiler Construction
Computer Science Tripos
Part IB
Lent
16 lectures
MWF 10:00 AM
9 Caltech Units
Evaluator: Thomas Vidick
Option credit
Closest to CS 131: Programming Languages
        "This course aims to cover the main concepts associated with implementing compilers for programming languages. We use a running example called SLANG (a Small LANGuage) inspired by the languages described in 1B Semantics. A toy compiler (written in ML) is provided, and students are encouraged to extend it in various ways."

2. E-Commerce
Computer Science Tripos
Part II
Lent
8 lectures
MWF 10:00 AM
3 Caltech Units
Evaluator: Thomas Vidick
General credit
No Caltech equivalent course.
        "This course aims to give students an outline of the issues involved in setting up an e-commerce site."

3. Computer Networking
Computer Science Tripos
Part IB
Lent
20 lectures
MWF 11:00 AM
9 Caltech Units
Evaluator: Thomas Vidick
Option credit
Closest to CS/EE 145: Projects in Networking

"The aim of this course is to introduce key concepts and principles of computer networks. The course will use a top-down approach to study the Internet and its protocol stack. Instances of architecture, protocol, application-examples will include email, web and media-streaming. We will cover communications services (e.g., TCP/IP) required to support such network applications. The implementation and deployment of communications services in practical networks: including wired and wireless LAN environments, will be followed by a discussion of issues of network-management. Throughout the course, the Internet's architecture and protocols will be used as the primary examples to illustrate the fundamental principles of computer networking."

4. Computer Vision
Computer Science Tripos
Part II
Lent
16 lectures
TT 12:00 PM
9 Caltech Units
Evaluator: Thomas Vidick
Option credit
Closest to CS/EE/ME 134: Autonomy

"The aims of this course are to introduce the principles, models and applications of computer vision, as well as some mechanisms used in biological visual systems that may inspire design of artificial ones. The course will cover: image formation, structure, and coding; edge and feature detection; neural operators for image analysis; texture, colour, stereo, and motion; wavelet methods for visual coding and analysis; interpretation of surfaces, solids, and shapes; probabilistic classifiers; visual inference, recognition, and learning."

5. Cryptography
Computer Science Tripos
Part II
Lent
16 lectures
MWF 12:00 PM
9 Caltech Units
Evaluator: Thomas Vidick
Option credit
CS 152. Introduction to Cryptography.

"This course provides an overview of basic modern cryptographic techniques and covers essential concepts that users of cryptographic standards need to understand to achieve their intended security goals."

Course	Time	Lectures	1	2	3	4	5	6	7	8
Compiler Construction	MWF 10	16	▓	▓	▓	▓	▓			
E-Commerce	MWF 10	8						▓	▓	▓
Computer Networking	MWF 11	20	▓	▓	▓	▓	▓	▓	▓	▓
Computer Vision	TT 12	16	▓	▓	▓	▓	▓	▓	▓	▓
Cryptography	MWF 12	16	▓	▓	▓	▓	▓			

Cambridge Michaelmas Term Course List:
Total CIT Units for term abroad: 36

Course by Correspondence/Units:
Information Theory: EE/Ma/CS 126   9 units
Principles Of Comms.:   CS/EE 145   9 units
Data Science: 6 units
Natural Language Processing: 6 units
Quantum Computing: 3 units
Business Studies: 3 units

1. Information Theory
Computer Science Tripos
Part II
Michaelmas
16 lectures
12:00 – 1:00 Oct 5th – Nov. 9th
9 Caltech Units
Evaluator: Thomas Vidick
Option credit
EE/Ma/CS 126 ab. Information Theory
        "This course introduces the principles and applications of information theory: how information is measured in terms of probability and various entropies, how these are used to calculate the capacity of communication channels, with or without noise, and to measure how much random variables reveal about each other. Coding schemes including error correcting codes are studied along with data compression, spectral analysis, transforms, and wavelet coding. Applications of information theory are reviewed, from astrophysics to pattern recognition."

2. Quantum Computing
Computer Science Tripos
Part II
Michaelmas
8 lectures
11:00 – 12:00 Oct 5th – Oct. 22nd
3 Caltech Units
Evaluator: Thomas Vidick
Option credit
There is no clear equivalent to a Caltech course.
        "The aims of the course are to introduce students to the basics of the quantum model of computation. The model will be used to study algorithms for searching and factorisation. Issues in the complexity of computation will also be explored."

3. Principles of Communications
Computer Science Tripos
Part II
Michaelmas
16 lectures
11:00 – 12:00 Oct 24th – Dec. 1st
9 Caltech Units
Evaluator: Thomas Vidick
Option credit
No clear Caltech equivalent course.

"This course aims to provide a detailed understanding of the underlying principles for how communications systems operate. Practical examples (from wired and wireless communications, the Internet, and other communications systems) are used to illustrate the principles."

4. Data Science: principles and practice
Computer Science Tripos
Part II
Michaelmas
12 lectures
10:00 – 11:00 Nov 2nd – Dec. 1st
6 Caltech Units
Evaluator: Thomas Vidick
Option credit
No clear Caltech equivalent course.

"The course will develop core areas of Data Science (eg. models for regression and classification) from several perspectives: conceptual formulation and properties, solution algorithms and their implementation, data visualization for exploratory data analysis and the effective presentation of modelling outputs. The lectures will be complemented by practical classes using Python, scikit-learn and TensorFlow."

5. Business Studies
Computer Science Tripos
Part II
Michaelmas
8 lectures
12:00 – 1:00 Nov 12 – Dec. 1st
3 Caltech Units
Evaluator: Thomas Vidick
General credit
No clear Caltech equivalent course.

"How to start and run a computer company; the aims of this course are to introduce students to all the things that go to making a successful project or product other than just the programming. The course will survey some of the issues that students are likely to encounter in the world of commerce and that need to be considered when setting up a new computer company."

6. Natural Language Processing
Computer Science Tripos
Part II
Michaelmas
12 lectures
12:00 – 1:00 Oct 5 – Nov 1
6 Caltech Units
Evaluator: Thomas Vidick
Option credit
No clear Caltech equivalent course.

"This course introduces the fundamental techniques of natural language processing. It aims to explain the potential and the main limitations of these techniques. Some current research issues are introduced and some current and potential applications discussed and evaluated. Students will also be introduced to practical experimentation in natural language processing."

Course	Time	Lectures	1	2	3	4	5	6	7	8
Information Theory	MWF 12	16	▓	▓	▓	▓	▓			
Quantum Computing	MWF 11	8	▓	▓	▓					
Principles of Communications	MWF 11	16				▓	▓	▓	▓	▓
Data Science: principles and practice	MWF 10	12				▓	▓	▓	▓	▓
Business Studies	MWF 12	8						▓	▓	▓
Natural Language Processing	MWF 10	12	▓	▓	▓	▓				