Dear professor,

My name is Tianyi Xia, a third-year undergraduate in Harbin Institute of Technology, China and I'm enrolled as an exchange student in UC Berkeley in the following semester. I currently major in Information and Computing Science and have a double degree in Cybersecurity. I'm so interested and fascinated by your URAP projects on the website. I sincerely long for the chance to join your lab and make my contributions to the lab.

While my background does not include direct experience in research in the intersection of neuro technology, mathematical modelling and AI, I possess extensive expertise in programming and mathematical modeling. I think it will help during my future study in cognitive science. Moveover, I love to try new things in the past 2 years and not only have I been an algorithm developer in the university robotic team but also I did mathematical research under the guidance of the dean in our school. And now, I think I have to focus on a specific research domain, and your lab will definitely be my first choice. Because I love to combine ideas and tools from several technology especially those like neuroscience, psychology, mathematics and computer science. Not only because I think it's a meaningful and promising area which attracts me, but also I can fully utilize my background and advantages.

Below are my personal statement.

There is a piece of iyrics "Anywhere door leads to music, and beyond the magic door, we can all fly freely. It' s the taste of freedom." from my favourite music band. UC Berkeley, to me, is like the 'Anywhere Door', a gateway from which I can embark on an extraordinary journey. And URAP will be a valuable opportunity to pursue my academic dreams and future career.

Obsessed with science and technology, I aim to become a versatile student with interdisciplinary skills. To achieve this goal, I chose mathematics as my major and pursued a minor in Cybersecurity. I believe a double degree can empower me to tackle practical engineering challenges by applying mathematical concepts in real-world scenarios, thus transforming theoretical knowledge into tangible solutions. Furthermore, I successfully passed the membership examination, including C programming examination and a project involving the design for a smart car based on stm32 board, and became a member of the university robotic club when I was in first semester of freshman year. Balancing my major, minor, and extracurricular activities has been a challenging endeavor, but I have embraced it with dedication and determination. As a result, I have achieved various accomplishments. I currently maintain a cumulative GPA of 3.73

out of 4.0 in mathematics, with outstanding grades in my major courses. In my cybersecurity minor, I have consistently scored over 90 out of 100 points in most courses, some of which are listed in my major subject transcripts. As an algorithm designer and computer vision engineer in our university robotics team, I spent most of my time programming and developing for robots. Our team has achieved remarkable success including several national prizes in Robomaster University Championship, a well-known international competition for university-level engineers. With proficient skills in robotics and programming, I have designed and tested several projects of various functions in robots. For example, I have developed the algorithm for path planning, navigation, autonomous localization and object detection based on the ROS environment and c++ language. Moreover, I have focused on developing a target tracking and aiming system in complex motion environment enabling the robots to act with greater precision.

Under the guidance of professors in our university, I have successfully completed a draft paper on the topic of distributed algorithm for matrix-variable optimization problems with general constraints. This endeavor involved conducting theoretical proofs with the assitance of Ph.D students in our group and performing

the experiments independently. We are planning to submit this paper to the 'Neural Networks' journal in the near future. On top of that, I am currently engaged in medical image segmentation research using deep learning techniques. To date, I have already conducted several experiments and tests with different models on ultrasound images.

I have also attended several mathematical modelling competition and completed 3 paper related to data analysis and algorithms. Through those experiences, not only did I improve my skills in mathematical modeling and data science but also I learnt to organize a team to work together for a project as the captain.

Last month, I was selected as the 'Mitacs Globalink Research Intern' in University of Alberta from Aug. 2024 to Oct. 2024, supported by China Scholarship Council(CSC) and Mitacs. This research project is to study the spatial memory and cognition as well as social interactions of animals for mechanistic modeling of animal movements.

As above, I have tried abundant academic activities. From those experiences, not only did I improve my programming and analysis skills, but also I found my true interest and advantage in the intersection of medical science, computer technology and mathematics. So, I sincerely hope to do further research on this

field with my proficient ability in programming and mathematical modeling.

In addition to my academic performance, I’ m also keen on a diverse range of activities. I’ m an amateur of football, tennis and skiing. I’ m also an outstanding runner, earning third prize in both 100m individual races and relay races. As a music enthusiast, not only am I intrigued by the uplifting and enchanting melodies of music, but also I’ m dedicated to have deeper understanding of the music including its background and creation methods.

I hold the belief that I’ m able to leverage my interdisciplinary skills and opportunities provided by your laboratory to full potential since I’ m confident in learning new things quickly and love challenges. In this semester, I plan to enroll in machine learning courses to strengthen my analysis abilities. And I intend to explore courses related to AI and neuroscience, which will greatly benefit my future researches.

I aspire to engage in the URAP program to assist the professor to conduct cutting-edge scientific research. Because URAP is not just a research opportunity for me; it is a gateway to endless possibilities, and I am excited to be engaged in this vibrant project. And I am scheduled to be in the U.S. from January 2024 to July 2024, fully committed and prepared to dedicate my time and

efforts to contribute meaningfully to your research endeavors.

I would be deeply grateful for the opportunity to discuss further how my skills and aspirations align with the projects and goals of your laboratory. Please feel free to reach out to me at your earliest convenience if you find my qualifications suitable for your team. Thank you very much for considering my application. And if you have considered me as the potential candidate, please provide me with more details and advice for class application related to cognitive neuroscience.