# 2020 CLASS OF 1960 RECIPIENTS

**BRANFORD COLLEGE RECIPIENTS**

| STUDENT | CLASS YR |
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Avi Cooper……………………………………………………………………………………………23'

Al Larriva-Latt………………………………………………………………………………………21'

Rami Rajjoub…………………………………………………………………………………………22'

***NOT able to participate***

Jameel Alawa…………………………………………………………………………………………21'

Gabrielle Colangelo…………………………………………………………………………………21'

Annie Gao………………………………………………………………………………………………21'

Avi Cooper

Amount of award: 2,000

**Bio:**

Avi Cooper is from Teaneck NJ and is a Computer Science major, though he is considering the joint Computer Science and Psychology major due to its relevance to Artificial Intelligence, his field of interest. He is particularly fascinated by the philosophical connotations of intelligence, and the application of intelligence in both biological paradigms (the brain) and computational ones. On campus he is heavily involved in Jewish life, serving as the co- president of the Yale Hillel Student Board, as well as the main coordinator for the Orthodox Synagogue for Yale and Downtown New Haven. He is also involved with InVe, the intelligence vehicles team, working on building a competitive autonomous sailboat. He is currently on a leave of absence in order to continue the research that he began during the summer with the generous support of the Class of 1960 Fellowship. Looking to the future, he plans on completing a PhD degree in the field of Artificial Intelligence, and to use this degree to begin a career in research, whether that be in academia or the industry.

**Summary:**

Last summer (in 2019) I performed research at the Artificial Intelligence Center at the Weizmann Institute of Science, where I was advised by Dr. Daniel Harari and Dr. Shimon Ullman, (the director of the lab.) Working at this lab gave me the tools and experience to conduct computer vision research. It also helped me build relationships with accomplished researchers in the field, which allowed for the opportunities of this summer. Dr. Harari connected me with Dr. Xavier Boix, a postdoctoral researcher at MIT and member of two labs at MIT, one lab at Harvard, as well as the multidisciplinary NSF center for Brains, Minds and Machines (which is hosted by MIT.) And these relationships continued into this summer — Dr. Harari joined the weekly large Zoom project meeting all the way from Israel.

For the entirety of the summer I conducted this research opportunity remotely due to COVID-19 state travel restrictions, but given that all this research was conducted on computers, the transition was particularly smooth. (In fact, even if I had been on-site in Cambridge, I would have still technically conducted the research remotely, as the computer supercluster on which I performed experiments is 60 miles away from the MIT campus.) I had more mentorship than I could have hoped for which included a standing Zoom meeting with my direct advisor, Dr. Boix, every day, and a project meeting with Dr. Boix, Dr. Harari and Harvard PhD student Spandan Madan once a week (who joined from his home in India.) Dr. Boix also connected me and this project with other members of the research community in Boston, from principle investigators of MIT labs to researchers in the monkey psychophysics lab.

Initially the project intended to focus on comparing how learning and generalization to new tasks occur both in the brain (modeled in monkey brains by their playing interactive games on iPad like devices) and deep neural networks on computers. During this initial phase I met several times with a researcher in the monkey lab, and thought hard about how to design an experiment that could be run both on monkeys and computers, a problem which hasn't been fully solved yet. I also began writing the software to run these experiments, engaging in work that I would have otherwise never have done as an undergraduate computer science student. However due to funding cuts for my advisor to work on animal experiments, the project pivoted to focus solely on computer experiments, but much of the overall trajectory was preserved.

In our work with deep neural networks we focused on two issues that are largely ignored in the field. First, in what ways can a deep network generalize to unseen data not present in the training data, and in what ways does increasing the generality of the training data improve generalization performance. In less abstract terms, I generated datasets of simple three dimensional objects, including planes, cars and lamps. Some of the objects were shown to the network from all perspectives, while others were only shown in a restricted set of poses. We tested the performance of the network on the unseen poses of the latter set. We made interesting findings, determining that the network could generalize to unseen poses, equivalent to image rotations, which was previously shown to be impossible. We also showed that increased data diversity in the training set facilitated better generalization, and that different object types influenced generalization performance on each other.

I will be taking a leave of absence to continue this research during the fall semester of 2020 as a paid research assistant in one of the labs at MIT, and will conduct this portion of the research remotely from New Haven. The project has a clear goal of publishing to a conference or journal by the end of the semester.

I wanted to take a moment to personally thank the Class of 1960 Fellowship for giving me the opportunity to engage in this research for the summer, and for opening the door for me to engage in research at this very level. Thank you

Al Larriva-Latt

Amount of award: 3,000

**Bio:**

Al Larriva-Latt is a senior English major from Pasadena, California. On campus, he has led a FOOT trip, acted in an anti-racist play, edited for *The New Journal*, and hosted a music radio show for four semesters. In his free time, he likes to skateboard and spend time with family.

**Summary:**

My goal this summer had been to embark on a five-state road trip, retracing the footsteps of HIV positive artist/activist/writer David Wojnarowicz, who traveled extensively in the American Southwest. Needless to say, the global pandemic cut those plans short. The other component of my research plan was to read Wojnarowicz' written works. Over a five-week period, I made my way through his published memoirs, monologues, and journal entries. Then, I put Wojnarowicz's writings in conversation with queer of color critique. Queer of color critique—a method of study which views the world through the intersecting lenses of race, class, gender, and sexuality—helped me contextualize the AIDS crisis. I learned that black people continue to be disproportionately affected by AIDS. Though black people comprise 13 percent of the US population, 43 percent of new HIV positive diagnoses are black people. AIDS scholars caution that the AIDS crisis was not a blip in the historical timeline. Rather, its disproportionate impact on communities of color was made possible by the unequal material conditions that continue to persist today. In a way, the same can be said for today's coronavirus, which black, brown, and indigenous populations are currently bearing the brunt of. I have not given up hope of embarking on my road trip. I am carefully monitoring the pandemic in the Southwest and, given the right circumstances, can set out on the road by the end of the calendar year. I would like to thank the Class of 1960 for funding my summer research; I am extremely grateful for its support.

Rami Rajjoub

Amount of award: 2,000

**Bio:**

My name is Rami Rajjoub and I am a second-generation Syrian that lives in Columbus, OH. I am a Molecular, Cellular, and Developmental biology major with a concentration in neurobiology as well as a Yale Global Health Scholar. I aspire to become a surgeon in the future, with particular interests in the neurosurgery and cardiovascular specialties. I have been involved in clinical research ever since my junior year of high school and am currently working in Dr. Murat Gunel's and Dr. Moliterno's lab focusing on neurosurgical research. In addition to my research interests, I am deeply involved with the global health community at Yale, where I hope to be able to study the impact of global health in vulnerable populations, particularly within refugee populations in the Middle East. I am active in various clubs here at Yale, some of which include the Yale Helix Incubator, Yale International Relations Association, the Yale Refugee Project and the Muslim Student Association. Personally, I love being active in any way, but I have particular passion for watching and playing soccer, which is what I did to pass the time throughout my summer. I also love traveling as I enjoy trying to seek new ways to explore and meet new people and places.

**Summary:**

This past summer, with the generous support of the Class of 1960 Fellowship, I was given the unique opportunity to conduct research with the Mayo Clinic Evidence-Based Practice Research program with the director of the program. The Mayo Clinic is one of only twelve institutions in the U.S. that is currently designated as an evidence-based practice center by the Agency for Healthcare Research and Quality. Dr. Hassan Murad M.D. is the current director of the Mayo Clinic Evidence-Based Practice Research Program and the author of  *JAMA's Users' Guide on Systemic Reviews and Meta-analysis to provide a framework for understanding and applying the results of synthesized evidence* who has granted me the summer opportunity to partake and co-lead the analysis of my own systematic studies in his research center for the second consecutive summer.

The coronavirus pandemic was the main focus of our lab for most of the summer. The coronavirus disease 2019 (COVID-19) pandemic requires making rapid decisions based on sparse and rapidly changing evidence in the medical and biomedical research fields. Evidence synthesis programs all over the country conducted systematic reviews for guideline developers, health systems clinicians, and decision-makers that usually take an average 6 to 8 months to complete. During the summer, my team and I developed a framework for evidence synthesis programs to respond to during the COVID-19 response, especially in a large multistate health system employing more than 78,000 people. The framework development included four components: an approach for conducting rapid reviews, a repository of rapid reviews, a registry for all original studies about COVID-19, and twice-weekly prioritized update of new evidence sent to key stakeholders.

My team and I then used our developed framework to start specifically analyzing the thousands of published medical articles pertaining to symptoms, diagnoses and prognoses, treatments, prevention

strategies, and epidemiology related to COVID-19 and establishing medical systematic reviews, meta-analyses, and guidelines that were used on the national and international level. One component of the project involved creating an online database that is easily accessible to public and that provided daily updates on current events and treatments on the coronavirus with respect to the available literature. I was exposed to new research techniques that include how to read systematic reviews, meta-analysis, meta-regression, meta-narrative synthesis, clinical practice guidelines. I was also able to learn how to analyze and quantify patient data through programs like EPIC and STATA.

My unique experience this summer enabled me to develop a strong foundation in understanding how evidence based research is conducted and to be able to apply this new based knowledge in my future science/neuroscience classes and research labs across Yale. After participating in this stimulating research environment, I will be better able to contribute my new skills at my new neurosurgery lab with Dr. Murat Gunel and Dr. Jennifer Moliterno to help advance the research in the respective field. I could not have partaken in this beautiful experiment without the generosity of the Class of 1960 committee!