**BUDGET JUSTIFICATION**

*The inclusion of faculty salary in this budget reflects the policy of the Division of the Biological Sciences (BSD) and the Pritzker School of Medicine. It is expected that investigators will recover reasonable and appropriate salary support from grants and contracts proportionate to the fraction of their time and effort devoted to the project. BSD faculty appointments are made on a twelve-month basis and the requested salary is based upon the investigator’s total University compensation. If an award is made in a reduced amount, the investigator will be expected to retain an appropriate amount of salary support in the budget.*

*For salaries in excess of the projected NIH salary cap, we have calculated the salary request against the cap ($197,300). Benefits are calculated at a rate of 20.4%.*

**Personnel**

**Ishanu Chattopadhyay, Ph.D., Principal Investigator (2.4 CM).** Dr. Chattopadhyay is an expert in machine learning, stochastic processes, and predictions and forecasting in complex biological and social systems. With help from a post-doctoral associate and a research staff, will be responsible for all theoretical development, software implementation, and data management.

**Peter J. Smith, M.D., Co-Investigator (0.3 CM).** Dr. Smith is a developmental psychologist, and will work with Dr. Chattopadhyay to ensure effective design and implementation of the tool in the pediatric primary care setting, and the consequent ADOS evaluation of children who are flagged to be at high risk.

**Michael E. Msall, M.D., Co-Investigator (1.2 CM).** Dr. Msall will help coordinate the study in the pediatric primary care facility, and oversee the aspects of ADOS administration to the flagged patients.

**James Mitchell, M.D., Co-Investigator (0.3 CM).** Dr. Mitchell will enable administering the proposed tool to consenting children in the clinic. He will be the attending pediatrician to the patients recruited in this study.

**TBN, Pediatric Research Assistant (2.4 CM),** will work with Dr. James Micthell to aid in the curation and management of data collected in the clinical aspects of this study.

**TBN, Pediatric Speech Therapist/Occupational Therapist/Social Worker (2.4 CM),** will work with Dr. Msall and Dr. Smith to administer ADOS evaluation to flagged patients.

**TBN, Pediatric DBP Postdoc (2.4 CM),** will work with Dr. Msall and Dr. Smith to help administer and interpret ADOS evaluation to flagged patients.

**TBN, Pediatric Nurse Practitioner (2.4 CM),** will work with Dr. Mitchell to administer the proposed screening tools to recruited patients.

**TBN, Postdoctoral Scholar (12 CM),** will report to the PI, and be responsible for theoretical development of recursive forests, and uncertainty quantification in belief evolution, and software implementation.

**TBN, Staff Scientist (12 CM),** will report to the PI, and be responsible for software development, and validation and tuning of the framework on large scale data sets.

**Travel ($5,000/YR)**

Funds are required for travel for the U Chicago team, (2 personnel yrs. 1-2, 3 personnel yr. 3) this includes the funds required for attending relevant workshops and presentations, and conference visits. We plan to attend two conferences annually to present our work. While the exact venues would be decided on the basis of paper acceptance, location, and the specific focus of the conferences on the specific years, we expect to present our work at the conferences.

**Other Expenses**

**HDSI Software Integration ($15,000/YR)** TheCenter of Healthcare Delivery Science & Innovation will work with your team to enable linking of your software tools with University of Chicago Medical Center (UCM) patient data, secure access of patient diagnostic and billing code histories, enable or facilitate carrying our background computation of the ACoR scores at preset intervals.

**ADOS-2 Cost ($196,000/YR)** ADOS-2 is the gold standard diagnostic evaluation methodology for clinical diagnosis of autism, which needs to be carried out by trained personnel, and is priced to cost $500 per patient in the Department of Pediatrics, University of Chicago (cost estimate for research grants). Our power calculations suggest we need to do at least 392 evaluations per year, which brings the cost to $196K/yr.

**Computation time ($20,000/YR)**

Funds are requested to cover the cost of computation time. The proposed work will develop inference algorithms that need to be run in cluster environments. The costs have been calculated by estimating the number of core hours deemed necessary to achieve project goals. Specifically, we assumed a flat cost of 0.75 per core hour as suggested by Amazon Elastic Cloud, and assumed a total 100K core hour compute time for the entire project. The total cost shown is the compute cost + charges incurred from data transfer to and from the cloud.

**Indirect Costs**

Our F&A rate is calculated at 62% from the Modified Total Direct Cost base amount. Our current DHHS agreement date is 2/20/2019.