AUTOBIOGRAPHY

Introduction and Current Job:

My name is Rajat Butola, and I am originally from India. I am currently based in Taipei, Taiwan, working as a **Postdoctoral Fellow** at the **Institute of Statistical Science**, **Academia Sinica**. At present, my postdoctoral research focuses on Bioinformatics and developing advanced machine/deep learning-driven methodologies for precision medicine, with a particular emphasis on predicting patient responses to immunotherapy. Building upon my expertise in data-centric modeling, I integrate multi-dimensional datasets, ranging from transcriptomic to clinical records, to develop predictive frameworks that not only achieve high accuracy but also provide meaningful biological insights. Through this experience, I have further strengthened my ability to lead interdisciplinary collaborations, and mentor junior researchers. I aspire to carry these skills forward in building an independent academic career, where I can contribute both to cutting-edge research in healthcare and education fields.

Academic Research Experience:

I hold a **Ph.D.** in **Machine and Deep Learning** techniques in the area of semiconductor nano-devices and circuits from **National Yang Ming Chiao Tung University** (NYCU), Hsinchu, **Taiwan**. The novelty of my doctoral work lies in leveraging the self-learning capabilities of artificial neural networks to optimize device and circuit performance. During this period, I had the opportunity to work on a variety of projects involving large and diverse datasets, including image, numerical, and time series data, which strengthened my expertise in data-driven modeling and predictive analytics.

Prior to my Ph.D., I completed my **M.S.** (Master of Technology) from **Department of Electronics and Communication Engineering** at the JIIT University, India, where my research focused on communication systems, signal processing foundation, Digital Image Processing and enhancement techniques. Specifically, I conducted a comprehensive study on thresholding methods and histogram equalization, with applications in digital images. This work enabled me to design image transformation techniques that achieved improved enhancement and overall better image quality. My M.S. research provided me with a strong foundation in Signal and Image Processing, which later evolved into my broader interest in applying advanced machine learning and deep learning methods to complex scientific and engineering problems.

Research Interest:

My research interests span a multidisciplinary spectrum at the intersection of Deep Learning/AI, Bioinformatics, Image Processing, and Communication. Early in my career, I focused on electronics & communication and Digital Image Processing that laid a foundation in Signal and Image Processing. In my doctoral work I focused on application of Deep/Machine Learning techniques. These experiences deepened my appreciation for the transformative role of data-driven methodologies

across diverse technological domains. Looking ahead, I am motivated to pursue research that bridges my backgrounds in Deep Learning, Image Processing, Artificial Intelligence etc.

Motivation:

My motivation to apply for **Postdoctoral Research Fellow** position arises from the strong alignment between my professional journey and your Hospital's mission of excellence in both research and healthcare. My academic career has equipped me with expertise in various domain including Deep Learning, AI, data-driven modeling, bioinformatics, molecular biology, statistical analysis and modeling etc. enabling me to pursue impactful research. I view research not only as a responsibility but also as an opportunity to do impactful work for society. This blend of research expertise and experience positions me to contribute holistically to the research and healthcare community.