

# Dr. Sandeep Kumar

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## Cover Letter

### Why I am excited?

The AI storm has taken the world by surprise, especially the rise of LLM models, which has caused both direct and indirect impacts on almost everyone on the planet. What interests me most are the technological challenges that come with training and inference of such models, particularly in the areas of computing and memory management. I believe this shift requires a ground-up change across almost all layers of modern computing and demands a highly optimized as well as flexible design that can adapt to the requirements of future models.

### What I Bring?

At Intel, I have led and mentored multiple projects focused on memory management and tiering for large-scale applications, including DNN training, LLM inference, RAG, virtualization, and key-value stores. This work involved engaging with the entire system stack—hardware architecture, the Linux kernel, device drivers, and user-space applications. The projects also required extensive use of profiling tools, such as hardware performance counters and various statistics exposed by the operating system. Interpreting these metrics demands a deep understanding of the internal workings of complex systems on modern servers.

I believe this experience has prepared me to handle the wide range of challenges that arise along the way. I am also a passionate learner and am constantly looking for opportunities to broaden my horizons, whether for work or simply out of curiosity.

### Collaborations and Team Player

I have collaborated closely with team members as well as with teams across Intel. I have also mentored multiple graduate-level interns and currently manage a small team of researchers working on projects related to upcoming memory technologies, LLMs, RAG, and virtualization. This work has resulted in multiple research papers published at top-tier conferences, as well as filed patents.

Sincerely,

Dr. Sandeep Kumar