Peter Tantono
Senior Seminar

Topic: Nanotechnology in Storage Systems

To define Nanotechnology it is important to understand Nanoscience. The prefix nano refers to one billionth. Nanoscience is the study of the fundamental principles of molecules and structures with at least one dimension roughly between 1 and 100 nanometers [1]. Nanotechnology by definition is the application of nanoscience into devices. Nanotechnology encompasses great number of applications. One particular topic of interest to computer science is the application of nanotechnology in storage systems.

The storage systems in the past few years have improved from having a 400 MB to a 180 GB commercial hard drive. Therefore, Nanotechnology is definitely the key component in the next generation of storage systems. Some examples of storage systems that I will cover are Atomic holographic optical storage, ferroelectric molecular optical storage and nanodrives. Both Atomic holographic optical storage and nanodrive are currently being researched by IBM, SIROS, BELL and many others. I will also cover the systematic and theoretical aspects of how these nanostorage systems. In conclusion I will also cover the future of nanostorage systems and it's social and economic impact.

BIBLIOGRAPHY

A.K. Menon, B.K. Gupta. 1999. Nanotechnology: a data storage perspective, *NanoStructured Materials 11*, 8, 965-986.

A.K. Menon, B.K. Gupta. 1999. Nanotechnology: a data storage perspective, *NanoStructured Materials 12*, 5, 1117-1125.

Sarid, D., McCarthy, B. & Jabbour, G.E. 2003. MEMS-based NanoProbe Technology For Data Storage Applications, *JOINTNAPMRC* , Tucson AZ (Jan.), 6-8.

Blauwe, Jan De. 2002. Nanocrystal Nonvolatile Memory Devices, *IEEE Transactions In Nanotechnology 1*,1 (March.), 72-77.

Yu, Hailing., Agrawal, Divyakant. & Abbadi, Amr El. 2003. Towards the Integration of MEMS-based Storage in Computing Systems, *Report Computer Science Department, UCSB*.

Vettiger, P., et al., 2002. The Millipede –Nanotechnology Entering Data Storage, *IEEE Transactions In Nanotechnology 1,*1 (March), 39-55.

Thomas, Michael E. 2003. Atomic Holographic Optical Storage Nanotechnology, *Colossal Storage Corporation.*
http://www.colossalstorage.net/3d_volume.pdf