**Dennis Shasha – Professor, Courant Computer Science Department**



**Dennis Elliot Shasha** is a professor of computer science at the NYU Courant Institute of Mathematical Science. Shasha’s work spans focuses on applying the tools of data science to extract knowledge across multiple disciplines. He works with biologists on pattern discovery for network inference, with computational chemists on algorithms for protein design; with physicists and financial people on algorithms for time series. In addition, Shasha’s lab has produced ground breaking work on clocked computation for DNA computing, in essence, outlining a method for storing programs inside DNA that simplifies nanocomputing, or computation at the molecular level. More broadly, Shasha and his colleagues have been at the forefront of advancing guidelines for reproducing, archiving, and querying computational experiments, a project which is crucial to the advancement of database-related research. Other areas of interest include database tuning as well as tree and graph matching.

Because he doesn’t sleep much, he has written six books of puzzles about a mathematical detective named Dr. Ecco, a biography about great computer scientists, and a book about the future of computing. He has also written five technical books about database tuning, biological pattern recognition, time series, DNA computing, statistics, and causal inference in molecular networks. He has co-authored over sixty journal papers, seventy conference papers, and fifteen patents. He has written the puzzle column for various publications including Scientific American.

After graduating from Yale University in 1977, Shasha worked for IBM designing circuits and microcode for the IBM 3090. While at IBM, he earned his M.Sc. from Syracuse University in 1980. He completed his Ph.D. in applied mathematics at Harvard in 1984 (thesis advisor: Nat Goodman).

**Professor Shasha’s research areas of potential interest to Qualcomm:**

* **Wireless Propagation Database:** Led by Prof. Shasha and Prof. Ted Rappaport, the NYU Wireless team has created a first-of-its-kind millimeter wave (mmWave) propagation database of all measurements made throughout Brooklyn and Manhattan at 28 and 73 GHz in 2012 and 2013. This database will be augmented with additional propagation measurements in upcoming years. The mmWave propagation database includes field measurements from dozens of locations, antenna beamwidths, transmitter and receiver heights, use cases, and propagation distances throughout Brooklyn and Manhattan, and provides immensely valuable data for Industrial Affiliate companies interested in developing futuristic beam forming and modem/system design products. The data are also valuable for predicting coverage and capacity estimates for future fifth generation (5G) systems.
* **Time Series Analysis:**  Time-series databases and analyses are of critical importance to a diverse range of data-rich public and private sector institutions, including, business and finance, physics, medical instrumentation, music, networking, and medical instrumentation. Shasha and collaborators are working on efficient algorithms for performing online windowed correlation analysis on very large time series datasets (thousands or even millions of numbers) as well as the problem of discovering bursts of activity.
* **Large Data Design:** Primarily with biologists and finance people, Shasha has built large scale distributed databases that need to achieve high performance across both transactional and data warehouse workloads.