Take Heed and Change Direction

The nightmare suffered by thousands of Gulf Coast residents after Hurricanes Katrina and Rita hammered home the disaster this country faces without adequate evacuation planning.

Traditional planning techniques are too computationally expensive or inefficient to evacuate large areas. So Shashi Shekhar, computer science and engineering professor, developed the Capacity Constrained Route Planner (CCRP) algorithm. It considers capacity restrictions in transportation networks to determine high-quality solutions to large-scale evacuation problems in much less time than other approaches.

While Minnesota is safe from hurricanes, other disasters potentially threaten our state; an attack at the Monticello nuclear power plant, for example, could have catastrophic consequences. Using a hypothetical disaster at Monticello,

Shekhar's team compared the existing evacuation plan (which made heavy use of two highways leading out of the area) with CCRP's results. CCRP suggested multiple routes and an evacuation schedule to limit traffic congestion, significantly reducing evacuation time to bring vulnerable populations out of danger. Shekhar hopes to develop this process into "a science of evacuation planning."

Results from this research are already in practice. Shekhar and graduate students Quingsong Lu and Sangho Kim used CCRP to help the Minnesota Department of Transportation develop evacuation plans for the Twin Cities metro area as mandated by the Department of Homeland Security.

SHASHIShekhar

SHASHI SHEKHAR WITH evacuation plan
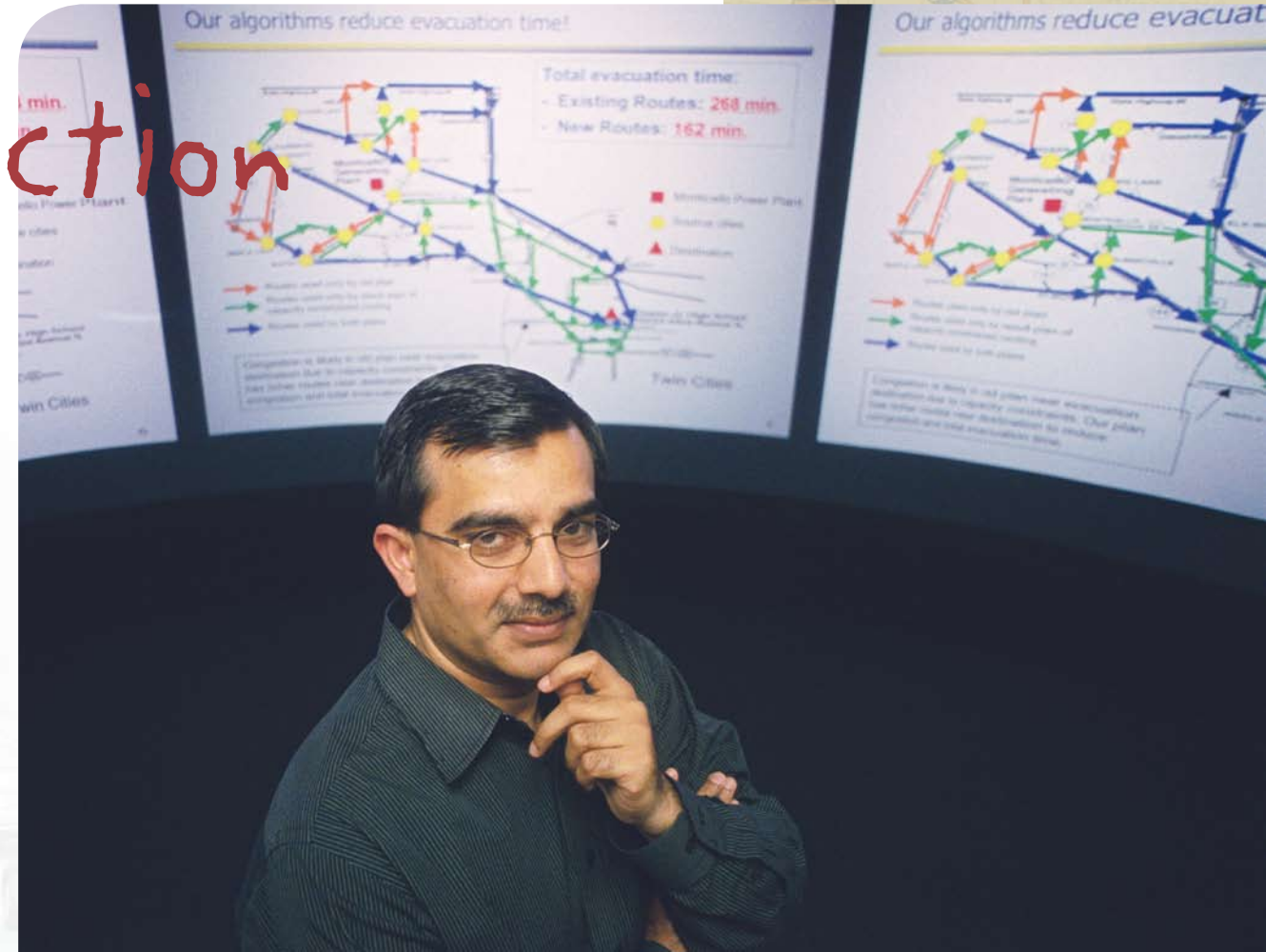
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Beth Stadler, associate professor of electrical and computer engineering, along with her department colleagues, Professors Anand Gopinath and Steve Campbell, are creating nanostructures thousands of times smaller than a human hair that can detect the release of dangerous gases. This nanotechnology could help prevent terrorist attacks, protect food supplies, and detect other leaks. Now that's a tiny way to make a big difference.

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