Micro-Inertial Navigation Technology (MINT)

MINT helps you find yourself — anywhere!
NREC’s wearable navigation aid goes where GPS can’t

How MINT Works

- Miniaturized RF ranging system and inertial measurement units (IMUs) are embedded in boots
- Senses footsteps, estimates location, and corrects for positioning errors
- Wearable computer tracks each step and communicates location to the command center and other personnel

Localization

- Know precise locations of personnel at all times
- Locate personnel in places with limited or no GPS: buildings, caves, and tunnels; forests; canyons; urban areas with tall buildings; during GPS jamming

Defense Applications

- Navigation and position tracking for dismounted soldiers
- Track and coordinate soldiers on missions such as clearing buildings and caves
- Assist with training and mission rehearsal

First Response Applications

- Locate, track, and coordinate emergency responders in buildings and other places without GPS

Civilian Applications

- Guide visually impaired individuals
- Geofencing for children and the elderly
- Interactive maps for museums and parks

Shoe-mounted sensors localize personnel by tracking their footsteps
Locates pedestrians in GPS-denied areas: underground, indoors, canyons, dense forests, urban canyons & during GPS jamming
No satellites or external references needed
Accurate to approximately 1 meter per hour of walking
Uses include dismounted navigation & tracking, building clearance, training, emergency response, guidance for the visually impaired, geofencing, interactive maps
Technology available for licensing

Phase II Performance

Indoor testing with MINT. Plots show the estimated path of a pedestrian during a two-hour test. (Left) Free inertial position estimate. (Right) Estimated path with the full MINT system. The final position error was approximately 1 meter.

Phase III Goals

- Accurate to 1 meter per 10 hours walking
- Reduced form factor packaging

Visit the MINT web page at: http://www.rec.ri.cmu.edu/projects/mint/

The views expressed are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.