# Brunel
## UNIVERSITY
## WEST LONDON

# Wide Area Inverse DGPS Model for Improved Positining Tracking

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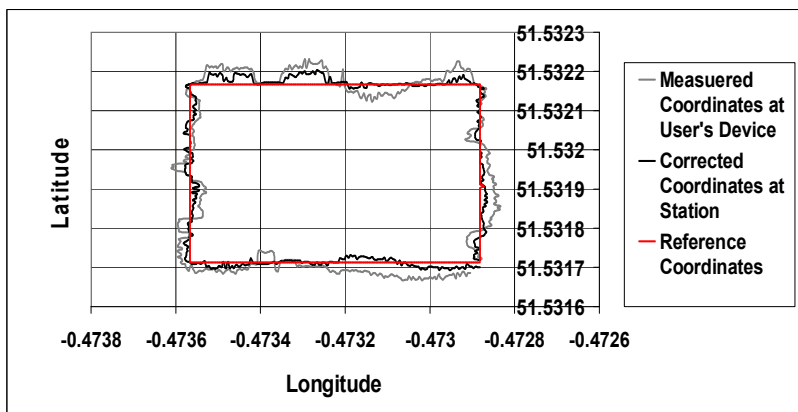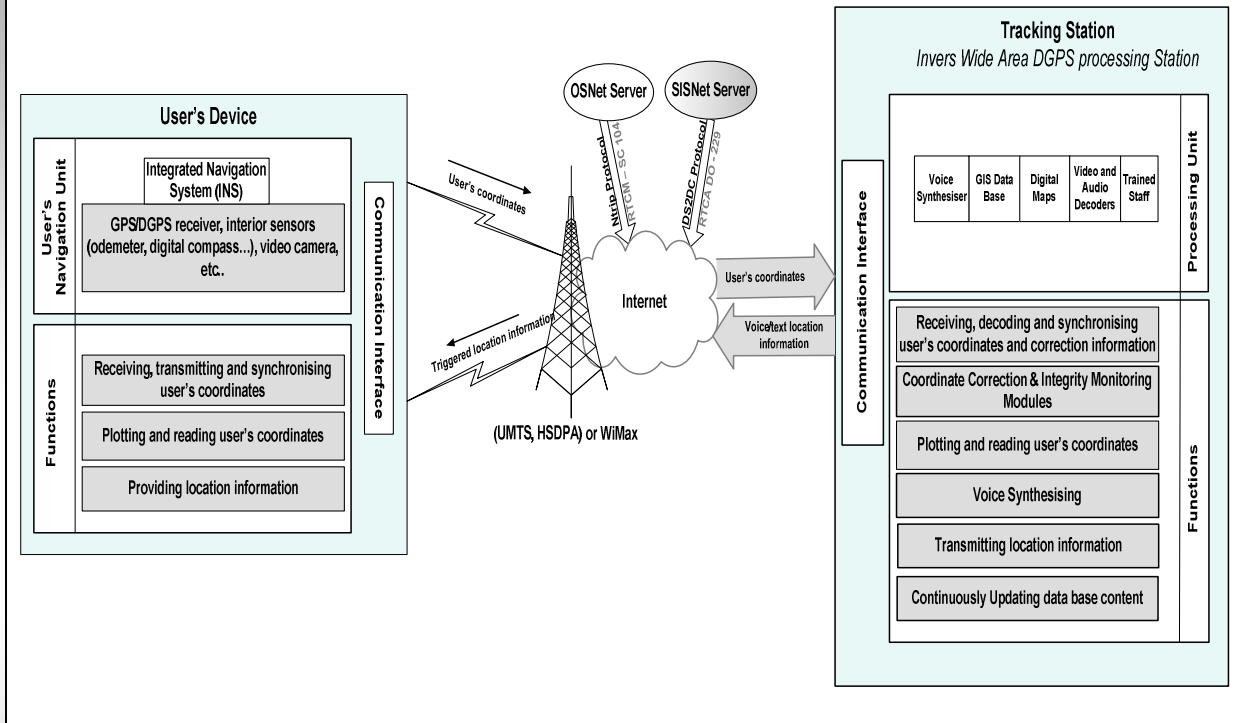## NAV08-The Navigation Conference and Exhibition- October 2008

## System Specifications:

- The developed system aims to provide accurate Location Based Services (LBS) to a wide spectrum of users with different needs.

- The system consists of two parts; the tracking station and the roving device.

- The system operates in two modes; centralised and mobile mode.

### High Level Architectural Design



Tracking Station
*Invers Wide Area DGPS processing Station*

User's Device

User's Navigation Unit

Integrated Navigation System (INS)

GPS/DGPS receiver, interior sensors (odemeter, digital compass...), video camera, etc..

Communication Interface

Functions

Receiving, transmitting and synchronising user's coordinates

Plotting and reading user's coordinates

Providing location information

OSNet Server   SISNet Server

User's coordinates

Ntrib Protocol
RTCM – SC 104

IDS2DC Protocol
RTCA DO 229

Internet

User's coordinates

Voice/text location information

Triggered location information

(UMTS, HSDPA) or WiMax

Communication Interface

Processing Unit

| Voice Synthesiser | GIS Data Base | Digital Maps | Video and Audio Decoders | Trained Staff |
|---|---|---|---|---|

Functions

Receiving, decoding and synchronising user's coordinates and correction information

Coordinate Correction & Integrity Monitoring Modules

Plotting and reading user's coordinates

Voice Synthesising

Transmitting location information

Continuously Updating data base content

### A Trail for User's Position Tracking



Latitude

51.5323
51.5322
51.5321
51.532
51.5319
51.5318
51.5317
51.5316

— Measuered Coordinates at User's Device
— Corrected Coordinates at Station
— Reference Coordinates

-0.4738   -0.4736   -0.4734   -0.4732   -0.473   -0.4728   -0.4726

Longitude

The tracking station has highly accurate and up-to-date users coordinates, in order to:

- Locate objects with dynamic distribution
- Provide location and environment Information
- Provide guidance direction

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