



GPR Autonomous system for Disaster management: location aspects for beam forming

Madhu Chandra⁽¹⁾, Tullio Joseph Tanz⁽²⁾

(1) Chemnitz University of Technology, Chemnitz, Germany,;
e-mail: madhu.chandra@etit.tu-chemnitz.de

(2) Institut Mines-Télécom-Télécom ParisTech, Univ. Paris-Saclay, LCTI, France,
e-mail: tullio.tanzi@telecom-paristech.fr

In Search and Rescue (SaR) operations, a Ground Penetrating Radar (GPR) constitutes a good way to detect buried people under debris. Coupled to an autonomous system, we obtain a very efficient tool available to access otherwise hard-to-reach spatial domains for the rescuers. Such areas are characterised by very hostile conditions. Such zones are treacherous due to their inherent instability and due to the restricted mobility in such environments: holes and deep subsidence, geological crevices, narrow passages, etc.

In this contribution we consider the design and necessary features of a cooperative network of RADAR antennas, distributed in each of the different Autonomous system Modules. The challenge would be to circumvent the difficulties posed by the restricted space available to autonomous systems.

In our considerations, we shall utilise location and attitude data produced by the self-sufficient systems derived from the Inertial Measurement Units (IMU), odometer systems and sensors information. Using this base of information the idea would be to calculate optimal beam-forming antenna configurations for maximising the usefulness of the backscattered signals. In doing so we shall also examine the possibility of constituting Sonar transducer-Antennas located on judiciously chosen positions on autonomous systems.

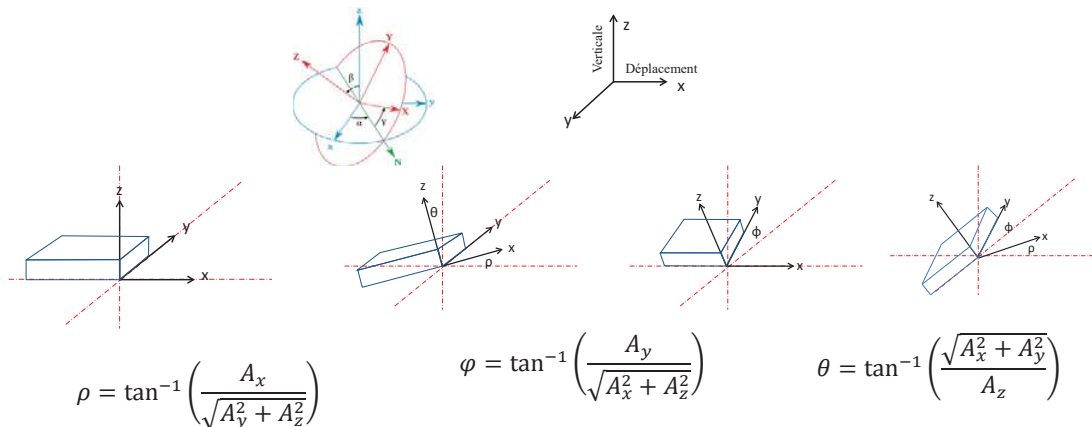


Figure 1. Pitch (ρ), Roll (φ) and Yaw (θ) estimation for beam forming

Tullio Joseph Tanzi, Madhu Chandra, Jean Isnard, Daniel Camara, Olivier Sebastien, Fanilo Harivelo. (2016) "Towards rone-Borne Disaster Management: Future Application Scenarios ". 06/2016; III-8:181-189. DOI:10.5194/isprs-annals-III-8-181-2016

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