Tenth A. P. Mitra Memorial Lecture

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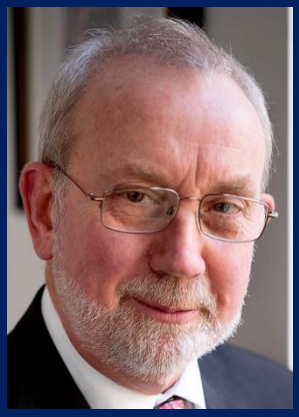
Webinar on:



A New HF Over the Horizon Radar Architecture

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Over the Horizon Radar (OTHR) provides wide-area, persistent surveillance options particularly for aircraft and ships and it can also be used to monitor sea-state and sea-ice. OTHR operates by reflecting signals in the high frequency (HF, 2-30 MHz) band of the ionosphere at altitudes ~ 300 km to provide a beyond-line-of-sight (BLOS) capability. Typical operational ranges lie between 500 km and 3000 km but shorter and longer ranges are possible. Conventional OTHR uses large transmit antenna arrays (typically 100-200 m long) and even larger multi-element receive antenna arrays, often extending to many kilometres, to provide sufficient azimuthal target discrimination relative to the receive antenna.

Recently a new OTHR architecture has been proposed by the author. This is the Networked OTHR (NOTHR), so called because it consists of multiple bistatic radar paths (plus an optional monostatic path) which are processed cooperatively. In contrast to conventional OTHR, NOTHR consists of a large aperture antenna array on transmit and several single antenna or small aperture receive antenna systems. NOTHR operates in either a multiple input, multiple output (MIMO) configuration or a multiple input, single output configuration (MISO) mode.

In this talk, we will compare and contrast conventional and NOTHR architectures, including discussing their relative advantages.

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