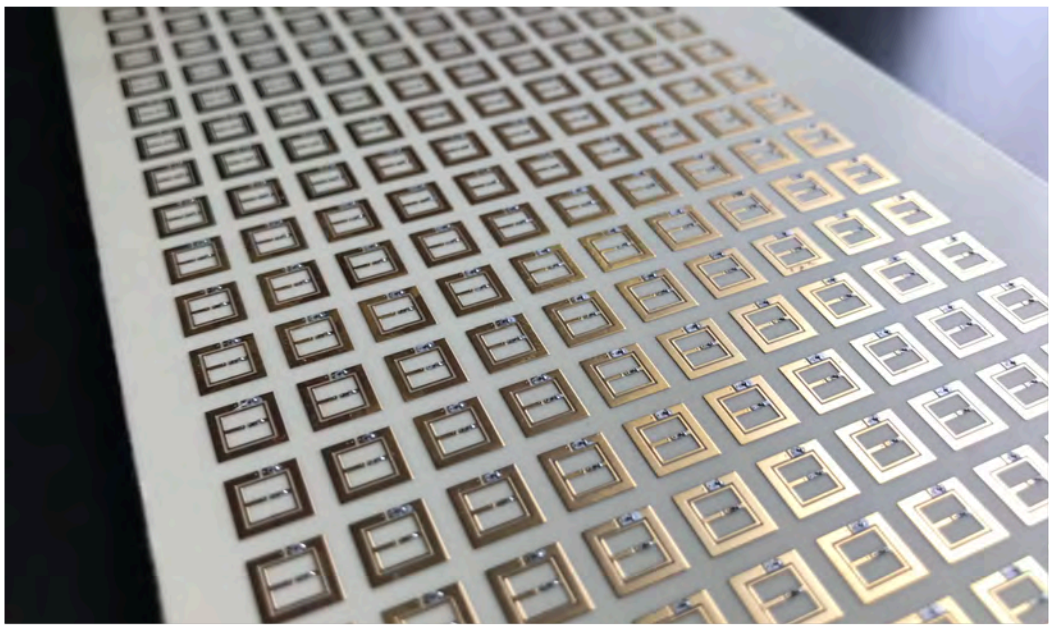
INDUSTRY & PARTNER SERVICES (IPS), CARLETON UNIVERSITY, OTTAWA, ON, CANADA

Smart Reflectors

for 5G Communication & Defense Systems



Electromagnetically Engineered Metasurfaces

based on fundamental electromagnetic principles of Metamaterials

Our novel configuration of a metasurface unit cell can independently control its reflection phase and magnitude at the specified frequency. This technology can operate on the new 5G frequency spectrum.

1

REFLECTANCE

independent control of both magnitude & phase, polarization

2

DYNAMIC

programmable real-time control, pixel-by-pixel or row-by-row

3

SOFTWARE CONTROL

embedded on-board metasurface controllers with electronic controls

Novel Structure
unique coupled resonator concept

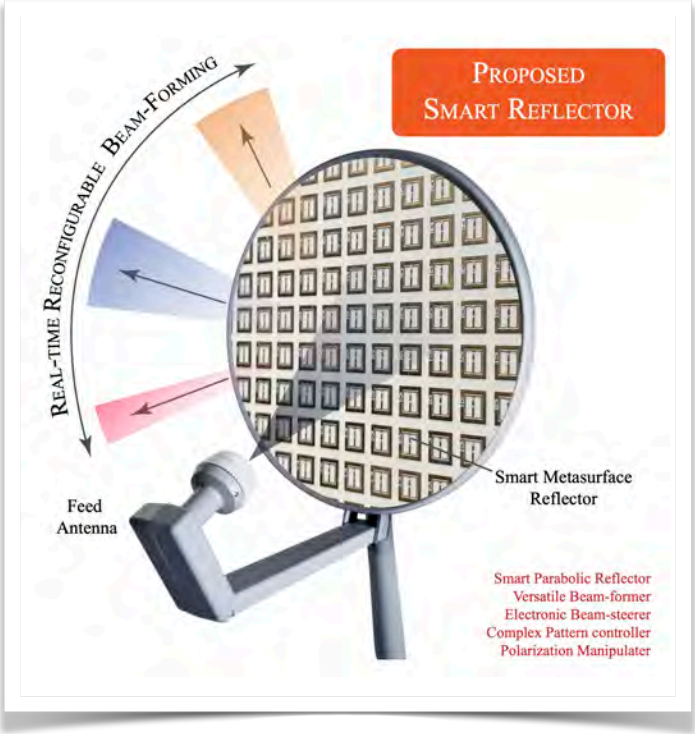
Electronic Controller
Custom on-board microprocessor and analog/digital control

Scalable Architecture
ideal for sub-6 GHz microwave bands, X-band, mm-Wave wave (e.g. 28 GHz)

The smart reflectors will provide key enabling features in 5G communication systems. Acting as smart reconfigurable reflectors in homes, offices and dense areas likes airports, they can provide superior coverage and ultra high-speed communication performance.

Potential Applications

Dynamic reflectance characteristics either as standalone reflectors or as alternatives conventional parabolic reflectors open up attractive phased array type solutions and possibilities in point-to-point links, satellites communication, tracking and Wireless backhaul, for example. Defense applications include but not limited to electromagnetic camouflaging & radar spoofing.



Inventors: Shulabh Gupta & Ahmed Z. Ashoor

The proof-of-concept demonstration of the technology is currently been developed in the X-band (8-12 GHz) for linear polarized operation. The demonstration is focussed on experimental characterization in terms of bandwidth, loss performance, amplitude and phase coverage. More details at https://arxiv.org/abs/2009.13369

"Independent Control of the Magnitude and Phase of a Reflected Electromagnetic Wave"

Patent Applications:
US 18/246,637 (filing date 24-Sept-21)
CA 3,196,718 (filing date 24-Sept-21)

FOR MORE INFORMATION ABOUT LICENSING OPPORTUNITIES AND RESEARCH COLLABORATIONS, CONTACT

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