

PROJECT / Physical-Layer Security - From Theory to Practice

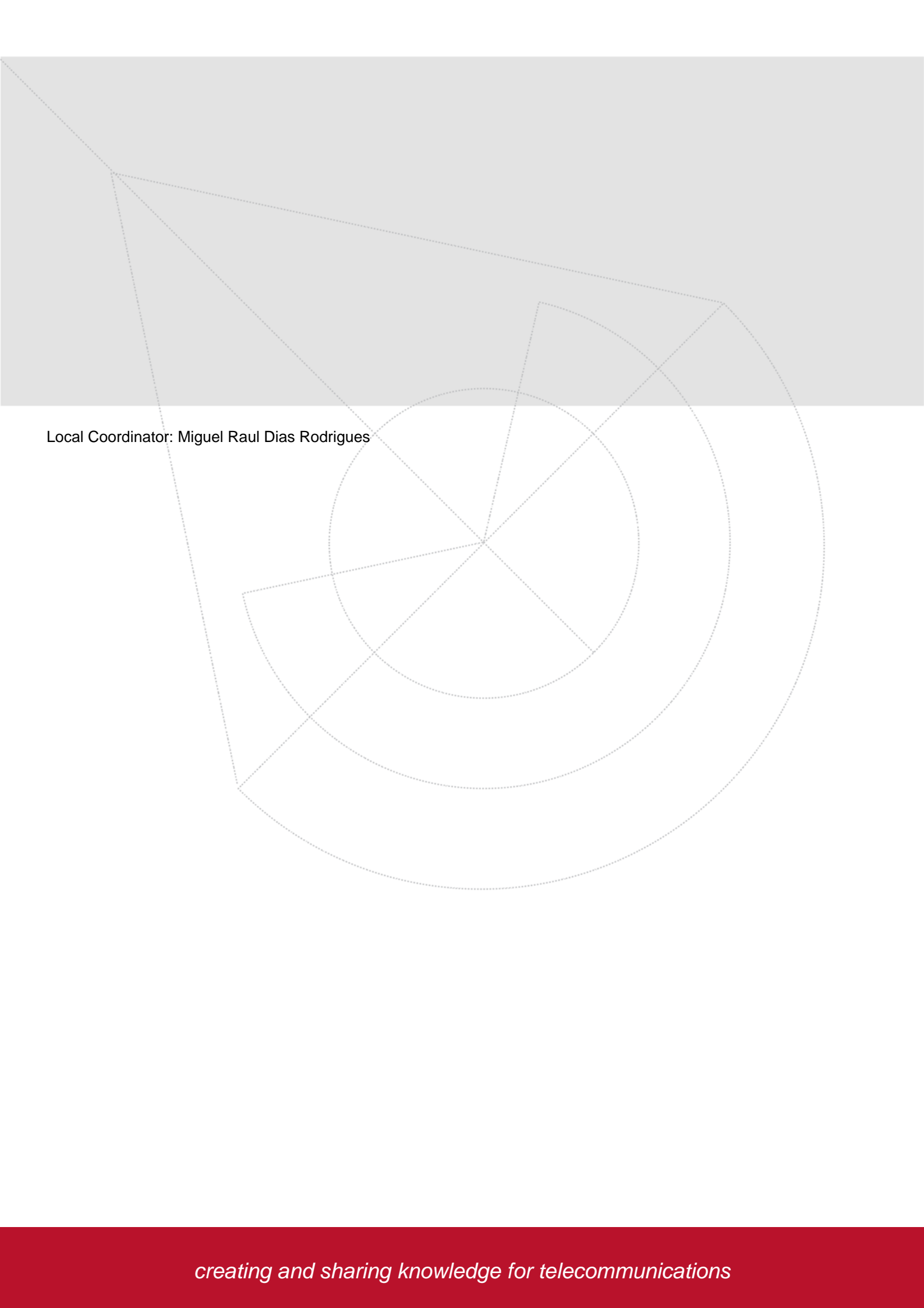
SECURE-COM

Main Objective:

The main objective of the research project SECURE-COM: Physical-Layer Security: Theory and Practice is to explore the fundamental reliability and security limits of communications channels as well as to conceive, investigate and develop practical reliable and secure transmission schemes. The issues of privacy and security in wireless communication networks have taken on an increasingly important role as these networks continue to flourish worldwide. Traditionally, security is viewed as an independent feature with little or no relation to the remaining data communication tasks and, therefore, state-of-the-art cryptographic algorithms are insensitive to the physical nature of the wireless medium. However, there has been more recently a renewed interest on information-theoretic security – widely accepted as the strictest notion of security – which calls for the use of physical-layer techniques exploiting the inherent randomness of the communications medium to guarantee both reliable communication between two legitimate parties as well as secure communication in the presence of an eavesdropper. This two-year collaborative research project builds upon the information-theoretic security foundations to i) study the fundamental reliability and security limits of communications channels and ii) conceive, investigate and develop novel practical reliable and secure physical-layer based transmission schemes. Our research team gathers considerable expertise in a wide range of complementary topics such as information and communications theory (in particular, code design), signal processing for MIMO systems, communications systems and network, and security, all of which are necessary to meet both the theoretical and practical challenges of this research. High level publishable and patentable results are expected.

Reference: IT/LA/431/2008, Funding: IT/LA, Start Date: 01-01-2009

Team: Miguel Raul Dias Rodrigues



Local Coordinator: Miguel Raul Dias Rodrigues