Collaboration Plan

The PIs on this proposal are:

Dr. Prvulovic at the Georgia Institute of Technology will act as the PI and point-of-contact for this project. He has over 20 years of experience in computer architecture, especially in hardware security, SW/HW interaction, and analog side-channels.

Dr. Alenka Zajic at the Georgia Institute of Technology will act as the co-PI and she has over 15 years of experience in antenna design, wireless communications, and signal processing for analog side channels.

Dr. Kumar at the University of Illinois Urbana Champaign will act as the co-PI and he has over 10 years of experience in computer architecture, system level design automation, tools for RTL- and circuit-level modeling, as well as prototyping, and tapeout of processors.

The PIs plan to hire 3 students that will be working on their individual research tracks but also meet together to work on integration of the project as described in proposed work.

The PIs plan to conduct the proposed research in a highly integrated manner, with continuous communication between the PIs and the students, especially between the two institutions (Georgia Tech and UIUC). This communication will be needed to ensure success of the project because all four main research thrusts are synergistically connected to each other, and each thrust will be pursued collaboratively by the PIs. Specifically, PIs Prvulovic and Kumar will have primary responsibility for Thrust 1, PI Kumar will have primary responsibility for Thrust 2, PI Zajic will have primary responsibility for Thrust 3, and PIs Prvulovic and Zajic will have primary responsibility for Thrust 4. However, Thrust 1 will need snippets and weights produced by Thrusts 2 and 3, and will provide signals for validation/calibration (Thrust 4), Thrust 2 will provide current/voltage shapes and other metadata to Thrust 3, and Thrust 4 will needs overall signals from Thrust 1 and measured signals from Thrust 3, and the results of Thrust 4 will serve as feedback for Thrusts 1, 2, and 3. Because of these inter-dependencies between the parts of the project, a key requirement for the success of the project will be to ensure that not only each thrust is succeeding, but also that they are succeeding in a way that benefits from and provides benefits to the other thrusts and the project as a whole.

To keep the entire project well-integrated, we will maintain direct communication as needed to make excellent progress in each thrust, and to keep each thrust compatible (and even synergistic) with the other thrusts. We will use email and Zoom for communication among participants, file sharing tools such as OneDrive for sharing large data and other files, and GitHub for sharing source code and text-based files such as JSON metadata.

Additionally, to keep the entire project integrated and successful, we will have regular bi-weekly meetings or the entire team (three PIs and three PhD students funded through this proposal, and also any undergraduate and graduate students who participate in the project through class projects, term projects, etc.). We also anticipate that the two PhD students at Georgia Tech will be co-advised by PIs Prvulovic and Zajic, and we will also pursue co-advisement across institutions, as long as it is in the best interests of both the students and the project.

Finally, in addition to bi-weekly meetings of the entire team, we will meet at least once in each year of the project in person to discuss the progress and future plans for the project in more detail, and to transfer any expertise that is easier to share in-person (e.g., signal measurements in the lab). Our budget includes domestic travel for at least one in-person meeting per year to support this plan.