## **Executive Summary**



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- 1. Title of the Project: Secure SHAKTI Microprocessor
- 2. Date of Start of the Project: 01-02-2020
- 3. Aims and Objectives: To develop a secure-variant of SHAKTI class of microprocessors

## to meet the growing cyber security demand of our country.

4. Significant achievements (not more than 500 words to include List of patents, publications, prototype, deployment etc)

Ensuring a Secure compute platform is the aim of this particular effort. The SHAKTI compute platform along with its variants are available at <a href="https://shakti.org.in">https://shakti.org.in</a>. The efforts have seen the emergence of 5 startups Incore semi (<a href="https://incoresemi.com/">https://incoresemi.com/</a>), Mindgrove (<a href="https://www.mindgrovetech.in/">https://incoresemi.com/</a>), Mindgrove (<a href="https://www.mindgrovetech.in/">https://www.mindgrovetech.in/</a>), Vyoma Systems (<a href="https://www.securweave.com/">https://www.securweave.com/</a>), Shakra Innovations, (<a href="https://shakrainnovations.co.in/">https://shakrainnovations.co.in/</a>) and adoption by ISRO and IGCAR. The government of India through the Ministry of Electronics and Information Technology has launched the Digital India RISC V program (DIR-V) with Prof. V. Kamakoti as the Chief Architect of the program. (<a href="https://pib.gov.in/PressReleasePage.aspx?PRID=1820621">https://pib.gov.in/PressReleasePage.aspx?PRID=1820621</a>). Over the last 4 years around 11 papers and 4 patents are published and granted respectively that shall be building blocks in realizing an atma-nirbhar safe, secure and reliable compute environment.

5. Concluding remarks:

The challenge is to mature the ecosystem to be quickly adoptable by the end users. Microarchitectural level Security will eventually be a big need and the effort taken through this project is aimed at addressing this particular gap and fill it effectively. We are seeing very good adoption of the ecosystem and shall fine-tune the latter to become more effective.