Background

- Design of conventional RF-DAC based transmitters has the bottle-neck in the required oversampling and digital filtering at high switching speeds. Scaling in CMOS technologies enabled the evolution of the conventional implementation at the expenses of high power consumption.
- The FD-DAC concept solves the problem of oversampling together with the consequent high switching speeds and enables wideband operation with significantly lower power consumption by utilizing low-speed DACs and frequency generation blocks to realise frequency bins.
- One solution to implement the frequency bins is by utilising Walsh transform.

Tasks (Three milestones)

- Literature survey (8 weeks)
  - Full system analysis of the wideband transmitters and the FD-DAC concept
  - The implementation of arbitrary waveform generator using Walsh-Transform (WT)
- Design and Implementation (10 weeks)
  - The implementation of the FD-DAC utilising WT-based DACs using:
    - Off-the-shelf components
    - Integrated in Fully-Depleted SOI 22nm
- Documentation (6 weeks)
  - Thesis
  - Publication/Patent/…etc.

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