

## ABSTRACT

Single layer non-linear adaptive filters have become a popular candidate for system identification in the presence of non-linearities in the system. An attempt has been made in this thesis to perform algorithm-architecture co-design for a trigonometric functional link adaptive filter (TFLAF), which is one such popular single layer non-linear adaptive filters. The TFLAF mainly consists of a functional expansion block, which expands the input signal trigonometrically to a higher dimensional space and an adaptive multiplier block, the weights of which are updated using a suitable algorithm. A COordinate Rotation DIgital Computer (CORDIC) based architecture has been proposed in the initial portion of this thesis for implementing TFLAF. The challenges faced has been discussed and a new delayed TFLAF with a pipelined CORDIC has been proposed to overcome the challenges. The proposed approach has been shown to offer good modeling performance when applied for identifying static and dynamic plants.