**Machine learning applications on CTA data for diagnosis of peripheral artery diseases (PAD)**

Characterized by the narrowing of the large arteries supplying the limbs, PAD is a growing health issue for the rapidly aging US population. The incidence of lower extremity amputation for PAD in SC is significantly higher than the national average, associated with high levels of morbidity and mortality, up to 40%–50% within 1 year of initial diagnosis and treatment. It is difficult to predict outcomes for individual PAD patients as a validated metric to quantify calcification of the lower extremities, comparable to the widely accepted Agatston score for coronary artery calcification, has not been developed. Furthermore, due to individual variability in disease progression and response to treatment, there is a significant unmet need for prognostic tools to risk-stratify PAD patients for surgical intervention according to expected outcomes. To address this challenge, we have been developing a meta-learning dense neural network (DNN) to aid surgeons in the analysis of CTA images of the lower extremities (specifically, to segment and track objects across multiple sequential images for identifying and quantifying vessel calcification).