Artificial Intelligence, Deep Learning, Cloud Computing and Gait Analytics
to Predict Alzheimer’s & Dementia Risk during a Primary Care Office Visit

**Phase One SBIR**

**Objectives:**
- Prove that a video-based markerless motion capture system can measure spatio-temporal and 3-D kinematics as accurately as GaitRite Mat and Vicon 3D motion capture systems.

**Methods:**
- The GaitIQ system, the GaitRite electronic mat, and the Vicon marker-based motion capture system will be used simultaneously to measure gait in 20 healthy persons and compare for accuracy and to train the machine learning markerless video system.

**Expected Outcome:**
- The GaitIQ system will measure gait parameters with the accuracy of gold standard electronic mats and marker-based systems.
- Cloud-based mobile application that captures gait using a single camera is designed.

**Phase 2 SBIR**

**Objective:**
- Test the ability of the GaitIQ system to capture the gait signature of cognitive loss as well as Alzheimer’s Disease specific and vascular pathology in the brain as measured using MRI.

**Methods:**
- Measure gait (using GaitIQ, GaitRite mat and 3D marker-based system), cognition, and brain changes (degenerative and vascular) in 200 older adults and test the ability of GaitIQ to capture gait signature of cognitive loss and gait signature of structural brain changes.
- Complete development of the cloud-based mobile application that captures gait using a single camera.

**Outcome:**
- Establish the ability of GaitIQ to capture the gait signature of cognitive loss and the gait signature of degenerative and vascular change in pre-clinical dementia.

**Implementation Phase**

**Clinical effectiveness trial of GaitIQ system**

**Objective:**
- Establish feasibility and effectiveness of GaitIQ system in a health care practice in terms of referrals and further investigation by health care provider, lifestyle interventions recommended by provider and adopted by patient.

**Methods:**
- Randomize implementation of GaitIQ system in selected health care practices and compare with offices not using GaitIQ, compare outcomes.

**Expected outcome:**
- Implementation of the GaitIQ system will result in increased referrals to specialists and increased prescriptions for lifestyle interventions by primary care providers, and will improve adoption of lifestyle interventions by patients.