Running Support Device

Sponsor and Customer Considerations
- Sarah Bettencourt [at right]
- Suffers from a physiological condition which results in continuous sense of vertigo and a deficiency in bodily coordination
- Requires stabilization to remain upright while running
- Desires a devise that will function independent of treadmill and can be used outdoors

Concept Development
- Tricycle configuration ruled out due to instability on hills and stopping
- Loss of volunteer welder eliminated the possibility of fabricating the 4-wheel support structure
- Re-evaluation of design, inspired by advisor encouragement to pursue a more “creative” approach, coupled fabrication and fiscal considerations resulted in the development of the 2-wheel concept and its eventual fabrication
- Introduced unique problem of designing and fabricating a pair 66” wheels

Prototype and Features
- Positive Attributes:
  - Robust, durable, and simple test bed for concept testing
  - Maneuverable, turning radius of 0
  - Modular and easily modified
- Negative Attributes:
  - Operation requires effort on part of the user
  - No peripheral features installed [ex: brakes, lights, etc.]
  - Wheel design features are hazardous
  - Materials not intended for long-term survivability or adverse weather

Finite Element Analysis
- Bending analysis for 350 pound load on support axle
- Loading analysis of wheel
  - General compression [static] loading
  - Lateral [turn] loading
  - Axial twisting [braking] torque

Conclusion
- Developed into a robust and maneuverable general support device
- Two wheel concept has the potential to be developed into a versatile assistance mechanism
- Fabricated rig in current configuration does not fully support user as desired