Expression Neuroscience Institute

Program Charter: Insight Interactive Diagnostic & Vision Therapy Platform

Program Overview

The Insight Interactive Diagnostic & Vision Therapy Platform aims to provide an open-source alternative to proprietary binocular vision disorder (BVD) diagnostic devices, such as Neurolens N3, by delivering a gamified diagnostic and therapy experience. This platform integrates vision therapy games with diagnostic tests to make BVD diagnosis and treatment affordable and engaging, with the long-term vision of eradicating untreated BVD within 10 years.

Program Objectives

• Develop a gamified BVD diagnostic test leveraging disassociated images rendered per eye.

• Implement eye-tracking calibration and hands-free gaze interaction for user accessibility.

• Incorporate vision therapy games that adapt to diagnostic results to provide an objective prism prescription.

• Ensure open-source availability and affordability, targeting consumer-grade HMDs (e.g., Meta Quest Pro).

• Validate diagnostic and therapeutic efficacy in clinical and non-clinical pilot studies.

Current Status

• Eye-tracking data collection tools built in Python with Matplotlib visualization.
• Basic crosshair-and-target prototype for dissociated binocular rendering in low-poly style.
• Calibration tools under development for gaze-based control without manual input.
• No formal diagnostic test or therapy games implemented yet.
• No external partners or pilots initiated.

Key Milestones & Timeline

• **Q2 2025**: Complete near vision measurements and fine-tuning of diagnostic crosshair tests

• **Q3 2025**: Complete far vision measurements and combined near/far left-right testing

• **Q4 2025**: Implement menus and local data storage on HMD; build initial test environment assets (pre-alpha)

• **Q1 2026**: Alpha build with audio guidance, patient education content, in-experience result visualization

• **Q2 2026**: Clinical validation planning and partnership outreach

• **Q3 2026**: Platform alpha with personalized vision therapy games and prescription algorithms

• **Q4 2026**: Beta test with multiple vision therapy games and expanded user testing

• **2027+**: Clinical validation of therapy outcomes and public beta launch

Metrics & Evaluation

• Calibration Quality Score (accuracy of gaze tracking)

• Inter-pupillary Distance (IPD) and base alignment statistics

• Diagnostic accuracy against standardized BVD tests

• User engagement: number of completed diagnostic sessions

• Therapeutic adherence: frequency and duration of game-based exercises

Resources & Funding Needs

• HMD headsets and eye-tracking hardware (e.g., Meta Quest Pro): ~$700 each
• Developer and clinical researchers for pilot studies
• Graphic assets and game development support
• Funding for clinical validation and IRB approvals

Next Steps

• Finalize diagnostic prototype and complete calibration workflow

• Develop therapy game proof-of-concept levels

• Recruit pilot users and clinical partners for validation

• Secure seed funding through grants and donors

• Integrate results into open-source repository and public outreach materials