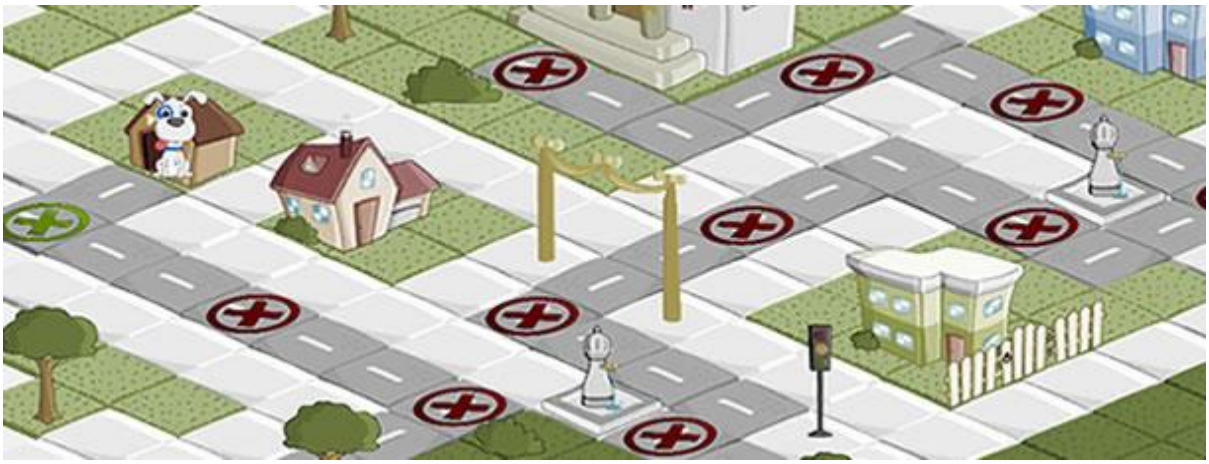
Vision measurement and improvement through perceptual learning

Classic treatment of **amblyopia (lazy eye)** consists of forcing use of the amblyopic eye, usually by patching the good eye (and even aligning both eyes by surgery). It results in a better accuracy of the lazy eye after the treatment, but the binocularity and stereopsis is not improved at all.

Vision Therapy has demonstrated that another approach is feasible. It involves a series of procedures carried out in both home and office settings, usually under professional supervision by an optometrist.

Virtual Reality and stereoscopic vision technologies can be used to design Tests and **Serious Games** where each eye receives different signals of the virtual world. Those computer activities can be prescribed by the optometrist to improve the vision of the child, not only the visual acuity of the lazy eye but also the stereoscopic vision. Serious Games are a way to engage young patients (and those not so young) in their rehabilitation therapy, and increase their compliance.



IdeasCAD started working in this field in 2009. At present, we are working in this field with **Visualia** (vision therapy clinic), **Pixels-Hub** (serious games design) and **ArtLine Solutions** (visual communication and interaction). The main outcome is **VISIONARY**, a set of games designed for the treatment of amblyopia.

BOWIE

www.visionarytool.com

Papers

Towards natural scene viewing tests: a study of limits of resolution in a CAVE system
Santiago Martín, Manuel J Blanco, David Swapp, Ramón Rubio
International Conference of Behavioral Optometry, Birmingham, UK; 09/2014

An Open-source C Sharp Library based on OpenGL for Stereoscopic Graphic Applications Development.
Santiago Martín, Liudmila Pupo, Yoander Cabrera, Ramón Rubio
1st International Conference on Simulation and Modeling Methodologies, SIMULTECH 2011 - Technologies and Applications, Noordwijkerhout, The Netherlands, 29 - 31 July, 2011; 01/2011

GLSV: Graphics library stereo vision for OpenGL
S. Martín, J. Suárez, R. Orea, R. Rubio, R. Gallego
Virtual Reality 01/2009; 13(1):51-57.

Parallax cues in the design of graphics used in technical education to illustrate complex spatial problems.
Santiago Martín, Ramón Rubio
Computers & Education. 01/2009; 53:493-503.

Proposal of interactive applications to enhance student's spatial perception
Samuel Morán, Ramón Rubio, Ramón Gallego, Javier Suárez, Santiago Martín
Computers & Education. 01/2008

Projects

FUO-EM-242-2013 Proyecto EVA: Actividades de evaluación de la visión
Ayuntamiento de Gijón
23.035,75 €

FUO-EM-104-2012 Desarrollo de juegos para el entrenamiento visual
Visualia
3.500,00 €