Projects history

Doing some looking back (and forward a bit). These are some projects I've worked on over the years that memory was gracious enough to serve up to me. Some of them are blips and I have no idea why I remember them. Some took a lot of effort, some didn't. Some were for organizations I worked for, including my own. Most projects for companies were me doing my professional mercenary humping for a paycheck, and not all that interesting. So it goes. Most projects listed here were purely my own creations. Generally they were fun, but writing code if you've ever done it can be horrifically aggravating, as you come face-to-face that you are an idiot. Some of them I wasn't sure they were going to work, but most did, although I might've declared victory and withdrawn from the field for a few. That's the beauty of prototyping. Some of them I worked on when I should've been doing something else, but when the Muse whispers she must be obeyed consequences be damned. There are times when I think that a lobotomy would have been a much easier course. But I did learn tons along the way and I can now confidently say, along with Tyrion Lannister, that I drink and I know things. I also expect, like the farmer who after winning the lottery said that he planned to keep farming until the money was all gone, that I'll probably keep going until my brain grows cold. I wouldn't say no to an intervention.

The dates in some cases are rough estimates.

Tom Portegys, October 20, 2023

Checkers. (Collaboration with Bill Bates and fellow Northern Illinois University grads, 1977).

Solar eclipse simulation on Atari computer. (1981).

TLADS: Test management system. (with Tom Speeter, Lucent Technologies, 1982).

The Peanut Butter Intelligence Test. (1981).

Artificial Intelligence in-house course. (developed and taught at Bell Labs, 1984).

Grammatical channels: A grammatical channel is a full-duplex message passing channel which is capable of parsing a user level message protocol. (Bell Labs, 1985).

Circuit/packet switching system synthesis. (with Mark Young, Lucent Technologies, 1985).

T.E. Portegys, "GIL - An Experiment in Goal-Directed Inductive Learning",
Ph.D. dissertation, Northwestern University, Evanston, Illinois, 1986.

Fast database transactions for the 5ESS Circuit Switching System. (Lucent Technologies, 1986).

Pattern recognition program for AI Days 88 at Bell Labs in New Jersey (Murray Hill?). Geoffrey Hinton possibly there. (1988).

EES tools: Auto environment startup; Itsprobe/Eureka code flow discovery (1989).

Sunlight: Daylight vs. darkness on revolving planet. (1994).

T.E. Portegys, "A Search Technique for Pattern Recognition Using Relative Distances",
IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 17, Number 9, September, 1995.

Music Transcriber: Computer listens to music and composes score. (Tony Chamberlain and Tom Lorch, Lucent Technologies, 1997).

GraffiTV is a device which gives a television viewer the ability to “draw graffiti” on television programming by imposing special effects on the audio and video streams. (with son Nick Portegys, 1998).

Flush images down toilet (GraffiTV demo). (1998).

Mona:

- T.E. Portegys, "A Connectionist Model of Motivation", *IJCNN'99 Proceedings.*
- T.E. Portegys, "Goal-Seeking Behavior in a Connectionist Model", *Artificial Intelligence Review.* 16 (3):225-253, November, 2001.
- T. E. Portegys, "Learning Environmental Contexts in a Goal-Seeking Neural Network", *Journal of Intelligent Systems*, Vol. 16, No. 2, 2007.
- T. E. Portegys, "An Application of Context-Learning in a Goal-Seeking Neural Network", *The IASTED International Conference on Computational Intelligence (CI 2005).*
- T. E. Portegys, "Instinct Evolution in a Goal-Seeking Neural Network", *The IASTED International Conference on Computational Intelligence (CI 2006).*
- T. E. Portegys, "Instinct and Learning Synergy in Simulated Foraging Using a Neural Network", *The 2007 International Conference on Artificial Intelligence and Pattern Recognition (AIPR-07).*
- Atani Maze-learning Robot. (2009).
- T. E. Portegys, "A Maze Learning Comparison of Elman, Long Short-Term Memory, and Mona Neural Networks", *Neural Networks*, 2010
- The Mox World. (2010).
- T. E. Portegys, "Discrimination Learning Guided By Instinct", *International Journal of Hybrid Intelligent Systems*, 10 (2013) 129–136.
- Thomas E. Portegys, "MONA: HIERARCHICAL CONTEXT-LEARNING IN A GOAL- SEEKING ARTIFICIAL NEURAL NETWORK", White Paper, 2014.
- T. E. Portegys, "Training Artificial Neural Networks to Learn a Nondeterministic Game", ICAI'15: The 2015 International Conference on Artificial Intelligence, 2015.
- Thomas E. Portegys, "Goal-directed behavior using contextual causation learning", 2022.
- Thomas E. Portegys, "Nest-building using place cells for spatial navigation in an artificial neural network", 2023.

Bubbleroids: A variation of the game of Asteroids. (2001).

Music of the Spheres: Noisy spheres bouncing on strings. (2001).

Space Squids multiplayer game. (Illinois State University graphics class, 2002).

T.E. Portegys, "An Abstraction of Intercellular Communication", *Alife VIII Proceedings,* 2002.

Virtual workbench: A Multi-user 3D Graphics Model Workbench. (ISU, State Farm grant, 2003).

SpamJammer: Anti-spam app (2003).

T.E. Portegys, K. M. Greenan,
"Managing Flocking Objects with an Octree Spanning a Parallel Message-Passing Computer Cluster",
The 2003 International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'03)

Mind Project Archive using DSpace. (ISU, contracted by David Anderson, 2004).

Cyd the android in the Block World. (ISU graphics class, 2004).

Tom Portegys and Janet Wiles, "A Robust Game of Life", *The International Conference on Complex Systems (ICCS2004)*.

T.E. Portegys, "Spores: a Push and Pull Peer-to-Peer File Sharing Approach",
The 2004 International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'04)

T.E. Portegys, "Catalyzed Molecule Replication in an Artificial Chemistry", *Alife IX Workshop on Artificial Chemistry and Its Applications*, 2004.

T.E. Portegys, "An Evolvable Artificial Chemistry Featuring Continuous Physics and Discrete Reactions", *Alife IX Proceedings*, 2004.

Enhanced email: Boost information bandwidth of email. (ISU, with James Wolf, 2005).

The "Affinity" artificial chemistry system is a search for interesting (e.g. auto-catalytic) chemical reactions and systems. It is loosely based on the VSEPR (Valence Shell Electron Pair Repulsion) chemistry model. Affinity has a number of tunable parameters, e.g. electron mass, orbital radii, etc. (2005).

ISU Gaming Club and Unix Club (UHACC) advisor. (ISU, 2005).

Triples game. (2005).

Sudoku. (2005).

The Effects of Apathy and Ignorance on Political Corruption in a Democracy Game. Or, Can You Fool All of the People All of the Time? (ISU, 2006).

Scorched Mars and Ginger Men Invaders multiplayer games. (ISU graphics and gaming class, 2006).

T. E. Portegys, "A Location-based Cooperative Web Service Using Google Maps",
The Conference on Information Technology and Economic Development (CITED 2006), Ghana.

Netflix movie recommendation contest. (ISU with James Wolf, 2006).

Java tickets: Clients use “tickets” to access services. (ISU, 2007).

T. E. Portegys and J. R. Wolf, Jr.,
"Technology Adoption in the Presence of Network Externalities: A Web-Based Classroom Game",
Informs Transactions on Education, Vol. 8, No. 1, September 2007.

Visual Studio data structures port to SQL Server (Microsoft, 2009).

ESP test for Second Life. (2009).

Diggers digging game. (2010).

Blackguard: a Rogue-like game with a first-person interface for Android and Windows Store. (2010).

Go Fish card game for Android. (2011).

Redmond area AI meetup organizer. (with Rob Young, 2011).

T. E. Portegys and J. R. Wolf, "Distributed Resource Governance Using Asymmetric Anonymity", 2011.

Lego Mindstorms NXT robot controlled by a goal-seeking neural network (2012).

Academy Awards contest for Grade Point Action (contracted by Zach Limacher, 2014).

SpanTracker: A Distance Measuring Device Using a Method of Spanning Separately Targeted Endpoints (App No. 13/423,278 03/19/2012, issued May 6, 2014).

Managing Computer Server Capacity (App No. PCT/US2014/027927, published Sep 18, 2014). (Citrix Labs, Dosojin project).

Machine Intelligence from Cortical Networks (MICrONS) Workshop sponsored by IARPA, February 11-12, 2014.

How the Internet of Things will make money as we know it obsolete, 2014.

Orac: content recommendation engine (2014).

T. E. Portegys, "Training sensory-motor behavior in the connectome of an artificial C. elegans", Neurocomputing (2015), pp. 128-134. DOI: 10.1016/j.neucom.2015.06.007

OpenWorm Journal Club talk on "Training sensory-motor behavior in the connectome of an artificial C. elegans". (2015).

Hacker Unit (remote startup accelerator). Talk and project reviewer, 2015.

T. E. Portegys, "Graph isomorphism testing boosted by path coloring", 2016.

Vari-Leash: VARIABLE LENGTH RETRACTABLE LEASH SYSTEM (provisional patent, 2016).

Matrix and vector library. (for ApoSys, 2016).

Information, life, and artificial evolution, unpublished chapter for "Habitability of the Universe Before Earth (Eds. Richard Gordon & Alexei Sharov)", 2016.

Thomas Portegys, Gabriel Pascualy, Richard Gordon, Steve McGrew, Bradly Alicea, "Morphozoic: cellular automata with nested neighborhoods as a metamorphic representation of morphogenesis", in *Multi-Agent Based Simulations Applied to Biological and Environmental Systems*, ISBN: 978-1-5225-1756-6, February 2017.

Integer Linear Programming (ILP) transportation work for Bias Intelligence. (2017).

Morphognosis:

- Thomas E. Portegys, "Morphognosis: the shape of knowledge in space and time", The 28th Modern Artificial Intelligence and Cognitive Science Conference (MAICS), Fort Wayne Indiana, USA, 2017.
- Thomas E. Portegys, "Learning C. elegans locomotion and foraging with a hierarchical space-time cellular automaton", Neuroinformatics 2018 Montreal.
- Thomas E. Portegys, "Generating an artificial nest building pufferfish in a cellular automaton through behavior decomposition", International Journal of Artificial Intelligence and Machine Learning, 2019.
- Thomas E. Portegys, "A modularity comparison of Long Short-Term Memory and Morphognosis neural networks" (2021).
- Thomas E. Portegys, "Morphognostic honey bees communicating nectar location through dance movements", Nature and Biologically Inspired Computing (NaBIC 2022).
- Thomas E. Portegys, "Dynamically handling task disruptions by composing together behavior modules" (2022).

Heat Track: NAVIGATION USING LASER HEAT MARK TRACKING (provisional patent with Lun (Steven) Li, 2017).

Thomas E. Portegys, "Coinspermia: a cryptocurrency unchained", the Future Technologies Conference (FTC) 2017, 29-30 November 2017 in Vancouver, BC, Canada.

C. elegans robot demo for South Korean documentary (Fall 2017).

Find Academic Forwarding Addresses (FAFA). (2017).

Bradly Alicea, Thomas E Portegys, Diana Gordon, Richard Gordon, "Morphogenetic processes as data: Quantitative structure in the Drosophila eye imaginal disc", *Biosystems*, 2018.

Skin Seer: Can skin cancer be detected by a handheld scanner? By Tom Portegys, Vitaly Vlasov, Richard Gordon, Susan J Crawford-Young, Alexander B Konovalov, and Steve McGrew. (2018).

ApoSys: Canadian nuclear power plant tool fault detection: INTELLIGENT FME DETECTION AND TOOL INTEGRITY SCOPE OF WORK (SOW). (with Oliver Wang and Steven Li, 2018).

Blockchain vending machine. (EY, 2018).

Hunter Jumper game with Godot. (with Raegan Fischer, 2019).

Tom Portegys and Shane Gingell, "A food foraging C. elegans robot", on exhibit at the Ars Electronica Center, 2019.

Axolotl X-ray imaging, Argonne Lab (2019).

Even (the odds): Anti-bullying/anti-harassment app. (2020).

Invest: stock market and crypto investor. (2021).

Thomas E. Portegys and James R. Wolf, "Distributed resource governance on a blockchain", Blockchain (2023).

Thomas E. Portegys, "Nest-building using place cells for spatial navigation in an artificial neural network", ICALRAI 2024.

Learning causation event conjunction sequences. (2024).

Nimbus: under construction. (2023).

Alzheimer's disease inclusions image analysis (2024).

Writer collaboration. (2024).

Drawing assistant. (2024).