

# Lewey Geselowitz

Specialist in spatial user interfaces.

## Overview:

- Pioneer in Spatial Technologies: **Tesla, Unity 3D, Verses.ai, Lucasfilm, Microsoft**
- Multiple industry landmark products: *Tesla Autopilot UI (2D and 3D), Unity AR/MR contextual app framework, Verses decentralized realtime spatial smart contracts, Star Wars™ experiences for Quest/VOID/MagicLeap, Oscar™ winning VR installation Carne-y-Arena, multiple HoloLens launch experiences including first use in cancer surgery, GPU accelerated data visualization for Excel 3D Maps, multiple Kinect titles and gesture systems for computer-vision based interaction, phylogenetic protein analysis tool HyperProtein 1.0, first GPU accelerated Windows (XAML for Windows XP).*
- Microsoft - 10 years across Xbox 360, Kinect, Office (Excel 3D), Windows Vista/10, HoloLens, etc.
- Lucasfilm - setup teams for success on “Vader Immortal”, Magic Leap, and Oscar winning “Carne-y-Arena”.
- Unity 3D - managed SDK runtime team on next-gen augmented and mixed reality development suite MARS.
- Verses.ai - from deep in the blockchain and startup scene to full logistics deployments.
- Clay [figure sculpting](#), physiology and yoga courses: ~9 years
- Over 40 side-projects and numerous articles now at [lewcid.com](http://lewcid.com) : ~15 years

## Contacts:

- Portfolio: <https://lewcid.com/lg/aboutme.html>
- Linked-In: <https://www.linkedin.com/in/lewey-geselowitz-3346b05/>
- Github: <https://github.com/leweyg>
- Facebook: <https://www.facebook.com/leweyg>
- Twitter/X: <https://twitter.com/LeweyGeselowitz>
- Physical: Marin County, north of San Francisco, California, USA.

## Experience Summary:

- 1/2021 – present: **Tesla**: Staff Software Engineer, Vehicle/Autopilot UI Framework
- 10/2019 – 11/2020: **Unity**: Software Engineering Manager, Unity MARS
- 1/2018 – Present: **Lewcid Systems**: Part-time Advisor
  - 6/2018 – Present: Verses.ai: Director of Spatial Standards
  - 11/2018 – Present: Karuna Labs: Engineering Advisor
- 6/2016 – 12/2017: **Lucasfilm** / ILMxLAB (~1.5): Senior UX Engineer, AR/VR/On-Set
- 8/2006 – 4/2016: **Microsoft**, Senior Software Engineer
  - 4/2012 – 4/2016: HoloLens Years (~4): Microsoft Studios, Office and Showcases
  - 10/2008 – 11/2013: Kinect Years (~5): Microsoft Natural User Interface Publishing
  - 8/2006 – 9/2008: Xbox 360 Years (~2): Microsoft Studios and Xbox Platform Team
- 5/2002 – 8/2006: **College Years** (~4): University of Florida, Computer Science
  - 5/2005 - 7/2005: Microsoft internship 2: Forza Motorsport 2 game engine for Xbox 360
  - 8/2004 - 5/2005: HyperCube Inc.: Graphics lead on HyperProtein 1.0 and HyperChem 8.0
  - 1/2004 - 3/2004: Microsoft internship 1: Windows Vista (WFP Performance Team)

## Experience:

1/2021 – present: **Tesla Inc.** ( <https://www.tesla.com/> )

- **Tesla** - Staff Software Engineer, Vehicle/Autopilot UI Framework, 1/2021 - present
  - Lead developer on the UI for Autopilot and full self-driving; including being point-of-contact between the Autopilot and Vehicle UI teams, and helping get FSD out of private beta. Worked closely with the vision and

controls teams to stream and visualize all relevant spatial and temporal signals, and optimize to ensure this runs efficiently on all vehicle configurations. Also managed the realtime 3d vehicle model, streams, configurations, runtime performance, etc.

- Lead developer for the Vehicle UI Framework doing systems, rendering and performance of on-screen controls and windows. Implemented visual debugging and performance analysis tools now part of every bug filed from the vehicle.
- Worked on the 2021 Model S refresh (Plaid), Tesla Vehicle Software V11/V12, Autopilot FSD beta 10.4-12, etc.

10/2019 – 11/2020: **Unity Technologies** ( <https://unity.com/> )

- **Unity** - *Software Engineering Manager, Unity MARS Runtime, 10/2019 - present*
  - [[Unity MARS](#) is framework for authoring spatial apps that dynamically adapt to different AR environments]
  - Helped organize a team of 20 people, directly managing 6 across 8 months (and covid) to pull three years of prototyping into a well received 1.0-1.2 releases. Setup bug tracking, release practises, backlogs and drove daily scrums; orchestrating major code refactors and trained team on software maintenance practises.
  - Implemented dynamic signed-distance-field "[proxy forces](#)" to solve complex objects layouts in realtime; brought in the idea of modeling the space around objects to help place them.
  - Setup planning and infrastructure for Unity MARS and general XR at Unity going forward.

1/2018 – present: **Lewcid Systems LLC** ( <https://lewcid.com/> )

- **Lewcid Systems LLC** - *Founder, 1/2018 - present*
  - **Consulting**
    - Numerous consulting clients across emergency management, ground-penetrating-radar, and interactive biofeedback systems.
  - **4DProcess.com**
    - Developed multi-dimensional data querying and visualization framework across WebGL and Unity 2D/XR. Combined spatial and charting interfaces, with efficient tiling and GPU transformation.
- **Verses.ai** - *Director of Spatial Standards, 6/2018 - 2022* ( <https://www.verses.ai/> )
  - [‘VERSES’ creates ‘spatial smart contracts’ for industrial and smart city automation ]
  - Director of Spatial Standards (9/2019 to 2022)
    - Ongoing support for HSTP standard bodies, client deployments, and technical partnerships.
  - Director of Spatial Technologies (6/2018 to 9/2019)
    - Formalized the HSTP (HyperSpace Transfer Protocol) specification, designed the SDKs, and filed associated patents.
    - Managed a team of six engineers delivering an integrated spatial-web suite across numerous front-ends (iOS, Magic-Leap, ESRI, and WebGL) and backends (Blockchain, DID, serverless Node.js, traditional SQL, etc.).
    - Technical partner relationship management, and coordinating integration plans with ESRI, Magic-Leap and other partners.
- **Karuna Labs** - *Technical Advisor, 11/2018 - present* ( <http://karunavr.com/> )
  - [Karuna Labs creates VR movement experiences for occupational-therapy]
  - Engineering Advisor 10/2019 - present
    - Frequent check-ins on technical next steps, hiring, etc.
  - Interim Engineering Lead 10/2019 - 12/2018
    - Managed a team of four engineers, developing VR phantom-limb and phantom-range-of-motion pain therapy experiences.
    - Designed a full body character input, augmentation and animation pipeline for medical quality range-of-motion, in-world visualization, and multiple pain-therapy treatment protocols.

6/2016 – 12/2017: **Lucasfilm/ILMxLAB, Senior UX Engineer on AR/VR Experiences** ( <https://www.ilmxlab.com/> )

- **Carne y Arena** (Oscar© winning VR experience directed by Alejandro González Iñárritu)

- Developed custom tracking solution, numerous dynamic effects, and editorial tools.
- **Vader Immortal: A Star Wars VR Series** (for Oculus Quest and Playstation VR)
  - Built numerous gameplay and story tell prototypes, lead early project setup and pre-production planning.
  - Worked with John Gaeta, David Goyer and other industry legends.
- **Star Wars: Secrets of the Empire** (for the VOID's "Hyper Reality" VR+physical space at Disneyland)
  - Built initial physical walkable prototype for Unreal, integrated VOID's SDK, setup for on-stage deployment, tuned motion tracking systems,
  - Developed pipeline for designers and modelers to work effectively at scale.
- **Magic-Leap Collaboration** (for unannounced Magic-Leap AR device)
  - Built numerous prototypes for augmented reality interactions and features, working closely with the Magic Leap team on hardware and software features and functionality.
- **Google Seurat Announce** (for next gen standalone mobile VR headsets)
  - Developed pipeline to take ILM film quality renders directly into 3d interactive environment.
  - Primary developer building and helped manage the Google relationship from conception to release.
- **Star Wars: Meet BB8** (conference VR installation)
  - Developer numerous BB8 interaction and play mechanics.
  - for providing user experience and interaction leadership, prototypes, and productized components across multiple experiences.
- **Advanced Developments Group**
  - Developing multiple Augmented Reality and Virtual Reality experiences from large-scale installations, to home VR, to Magic Leap augmented reality scenarios.
  - Responsible for providing user experience and interaction leadership, prototypes, and productized components across multiple experiences.

8/2006 – 5/2016: **Microsoft Corp. (10 years, + 2 internships, <https://www.microsoft.com/> )**

4/2012 – 5/2016: **HoloLens Years (~4 years): Microsoft Experiences, Research, Office and Showcases**

- **HoloLens Platform Team / Showcases**, Senior Engineer (5/2015 to 4/2016):
  - Envisioning and co-prototyping holographic showcase experiences for partners in numerous industries such as the retail, medical and design. Mentor for the Holographic Academy.
  - **Unannounced Medical Experience:** Led project from concept to pilot, for novel in-situ volumetric medical hologram, requiring high accuracy, reliability and interface efficiency.
  - **Lowe's and other Unannounced Experiences:** Developed both computer vision and interactive systems to align holograms to real-world spaces, volumetric data support, etc.
- **Microsoft Office / Excel 2016 3D Maps Team**, Graphics and GPU Lead (3/2014 to 5/2015):
  - Responsible for 3D interaction and GPU-based data processing and rendering in 3D Maps feature of Excel 2013/2016.
  - Developed longer term plans around performance scalability, integrating 2D systems, and doing distributed data querying.
- **Microsoft Research Cambridge UK** (Exchange Researcher in 3D Interaction, 11/2013 to 1/2014):
  - Holographic data interaction research, resulting in an incubation effort with the Office team.
- **HoloLens Microsoft Studios Team** (Product Incubation and Development, half time with Kinect titles from 4/2012 to 3/2014):
  - Augmented Reality interaction and storytelling prototypes for the teams behind **Holo-Skype**, **Young-Conker**, **Fragments**, **Holo-Studio** and others.
  - Early experiences for contextual communication, interactive data visualization and in-world classification and search. Utilized a variety of hardware and natural user interactions. Worked with partner teams to develop AR processes on new hardware.

10/2008 – 11/2013: **Kinect Years (~5 years and 5 titles): Microsoft Natural User Interface Publishing Team**

- **Zoo Tycoon** (Xbox 360/Xbox One, Concept to Ship, 11/2013, Kinect Lead)

- Lead, designed and tuned the gestural Kinect 2.0 features for the Xbox One launch including real-time augmented hand, cursor, face, and speech gameplay.
- **Kinect Star Wars** (Concept to Ship on 3/2012, ~4 years, Augmentation Lead)
  - *Goal: Avatar on screen moves like a Jedi, yet feels like it is your body.*
  - *Developed Solution: identify and proportionally exaggerate the kinesthetic experience of your own body, blending those exaggerations into custom tuned animations.*
  - Defined and lead the development of our avatar technology including our extensive animation-authoring pipeline and [augmented animation principles](#).
  - Designed and implemented numerous core interaction systems such as Inverse Body Dynamics Muscle estimation, real-time content driven pose blending, and body reactive camera systems.
  - Prototyped and drove many of the core game mechanics from 'force' interactions, 40+ simultaneous gestures ground combat, to augmented walking and holographic menu interactions.
- **Kinect Disneyland Adventures** (Concept to Ship, 11/2011, Kinect and Systems Engineering)
  - Restructured and improved the in-game animation and augmentation systems (including the core running, and hugging and magic throwing).
  - Implemented numerous debugging and memory analysis tools to achieve software stability and high fix rates for complex memory and multi co-routine based systems.
- **Kinectimals** (Concept to Ship, 10/2010, Kinect Interactions)
  - Helped design and tune most of the core interactions from the RC car, to throwing, and hand cuddling controls (straight line in your eye from actual hand, to virtual hand, to kitten).
  - Lead the prototyping and implementation of numerous 3d menu systems, which finally achieved a kid friendly, easy to use, and context embedded solution.
- **Kinect for Xbox 360** (Prototype to Ship on 10/2010, Kinect Interactions)
  - Was involved in many of the early hardware and software decisions, numerous early prototypes, marketing strategies, evaluating game companies, generating pitches, etc.
  - “Special Thanks” or ship credits on *Kinectimals*, *Kinect Adventures* and *Kinect Sports* for launch.
  - Bi-weekly NUI Tech calls between the platform and game studios for the past three years, helping coordinate between teams from prototypes to shipping.
  - Delivered two Gamefest talks (including the 2<sup>nd</sup> highest rated tech talk in 2010), and numerous smaller Kinect partner team presentations.

#### 8/2006 –9/2008: [Xbox 360 Years \(~2\): Microsoft Studios and Xbox Platform Team](#)

- 10/2007 - 9/2008: **Performance Infrastructure and Experience Engineering, DirectX / Xbox Platform Team** (4 release cycles)
  - Improved *PIX for Windows* and related technologies to better support numerous DirectX based Windows products around the company from XNA, to Photosynth and the Windows shell.
  - Provided designs and prototypes for a unified graphics and performance analysis framework, that helped lead to the upcoming integration of timing and GPU debugging technologies in Visual Studio.
- 7/2007 - 10/2008: **Static and Dynamic Code Analysis Team, XNA / Microsoft Game Studios**
  - Develop static, dynamic and memory analysis tools used across MGS and gradually integrated into the Xbox platform.
  - Performance and systems analysis for *Alan Wake*, *Viva Pi- ata* and *Fable II*.
- 8/2006 - 7/2007: **Forza Motorsport 2, Systems Team, Microsoft Game Studios** (Production to Ship, Graphics Engine)
  - Worked with artists on the environment and car rendering content pipelines and runtime.
  - Owned numerous systems and rendering optimizations, including split-screen at 60 Hz, and even built the final rendering library on my PC before we shipped.
  -

#### 5/2002 –8/2006: [College Years \(~4\): University of Florida, Computer Science, 2 Internships](#)

- 5/2002 - 8/2006: **Computer Science (BS), University of Florid**
  - Worked with Dr. Jorg Peters on virtual surgery simulations using haptic feedback devices.

- Final project was a complete language from parser to high level component syntax and optimizing compiler for HLSL, GLSL, and Render-man.
- 5/2005 - 8/2005: **Second Microsoft Internship** (Graphics Pipeline Dev, Pre-Production)
  - Helped port Rare's R1 engine from Xbox to the - Xenon- Xbox 360 alpha kits for *Forza 2* and other titles.
  - Implemented automatic graphics shader generation, to exactly match 3ds Max procedural materials, including automatically disassembling, modifying and reassembling HLSL shaders.
- 8/2004 - 5/2005: **Hyper Protein, HyperCube Inc.** (Graphics and Bioinformatics Lead, Concept to Production)
  - Designed and implemented interactive tools for phylogenetic protein analysis using quantum chemistry based molecular dynamics (exploring protein active sites through combined sequence and structure)
  - Structured a multi-document long term project interface for correlating multi-sequence DNA alignments with 3d structural information, this was disputed but ultimately proved most viable for focused research.
- 1/2004 - 3/2004: **Windows Presentation Foundation (WPF/Avalon)** (Performance Dev, First Microsoft Internship)
  - Worked on the Media Integration Layer (MIL) performance team to instrument and create profiling tools for WPF's native to managed communication layer, the engine behind XAML (Windows UI Framework). As of 2010, these tools were still in use in the MIL performance lab.
- 2002 - 2003: **Won numerous real-time mobile device interaction challenges**
  - 3D Voxel carving using the Tablet PC (awarded two Tablet PCs for my school)
  - Tools for drawing 3D SIRDS ("Magic Eye") on the Pocket PC (awarded a person Pocket PC)
  - Intuitive Ink-based animation interface on the Tablet PC ("Best Power Toy for Tablet PC")

### Personal Interests:

- **Visceral Experiences:** I take numerous courses on Eastern visualization and meditation practices, including [Kriya Yoga](#) training in India.
- **Sculpture:** I do live model figure sculpting and courses at the [Gage Academy](#) in Seattle. Important for understanding physical form and the nature of gesture: <https://lewcid.com/lg/sculpture/index.html>
- **Reading:** key favorites related to this document: architecture (Vitruvius), sculpture (Rodin), dance (Hayes), acting (Boleslavsky), meditation (Yogananda), philosophy (Rand), and computation (Feynman and Bill Gates).
- **Website:** posts on key topics such as [3D hand gestures](#), [augmented animation](#), [gesture recognition](#), as well as interactive experiences, like [voxel carving](#), [3D games](#), and [other tools](#). My site has been listed on Wikipedia for [3D Go](#) and [realtime SIRDS](#), and on sillier sites for [Quake mods](#) and [mathematics](#).
- **Other:** <https://lewcid.com/lg/aboutme.html>