



Application Platform



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# COGS Application Platform

 COGS cognitive application platform architecture is based on synthetic awareness. The purpose of synthetic awareness is to simply maintain an accurate internal state representation of the external environment and to be able to reliably operate various actuators and other devices:

- ✿ The means to respond and the ability to follow instructions
- ✿ Automatically isolate and identify the majority of potential system problems for quick remediation
- ✿ Provide the ability to operate cameras, scanners, switches, lights, valves, audio/video players and other devices and appliances
- ✿ Awareness of the environment
- ✿ Provide data through acceleration, temperature, chemical or gas sensors



# COGS Transaction Cost Economics

 COGS Platform is the first transaction cost economics based platform for distributed transaction processing systems, designed to approach theoretical maximum developmental and operational efficiencies, on any given platform.

 COGS provides the general purpose parallel programming solution necessary to take advantage of new low-power/multi-core chips, that require software to be written to take advantage of hardware that achieves performance, by being able to do many things at once.

 COGS uniquely allows an application to be reduced to a set of mathematical equations that can be algebraically simplified, solved and run with native efficiency, securely, reliably and with consistency across a wide range of hardware.

$$\sqrt{2^{1+2 \cdot 3}} \quad 101_2 = 5_{10} \quad 5(2^{0.999...} + 2) = 1 \quad \times \quad + \quad \div$$



# COGS Advanced Architecture

## *Cognitive Memory*

 COGS uses a proprietary, conditional block-chain based structure for storing cognitive memories. Cognitive memories are defined as a recorded condition state at a recorded time. Semantically encoded conditional block-chains express a mathematically simplified state with the least information necessary and as efficiently as theoretically possible.

## *Cognitive Reasoning*

 COGS uses a proprietary method based on virtual quantum annealing in order to perform simple cognitive reasoning by evaluating cognitive memories encoded as conditional block-chain expressions as quickly and efficiently as possible. Enabling low power and low latency, autonomous, embedded, distributed and utility scale consumer product applications that do not require continuous network connections to costly cloud scale computing resources.

 COGS essentially serves as a multi-dimensional cross-point switch that allows any input - in any language, representation, or unit of measure - to be properly evaluated against any other input - in any other language, representation, or unit of measure - and to generate commands and notification - in any language, representation, or unit of measure.

# COGS Well Rounded Platform

 COGS provides not only data, text, graphics and hypertext services, but also audio, speech, video, virtual reality, augmented reality and sensor telemetry.

 COGS provides interoperability between different and otherwise incompatible products, protocols and standards.

 COGS architecture is suitable for low latency applications and can operate autonomously on ARM, Intel, Artik or other low cost and low power embedded hardware.

 COGS scalability means large numbers of autonomous platform based products are able to reliably coordinate their actions towards a common set of shared goals, without requiring a scaling up of centralized server resources.

# COGS Platform Advantage

- ❁ Stand-Alone Operation Architecture
- ❁ Optional Network Connectivity Architecture
- ❁ Fault-Tolerant Architecture
- ❁ Logical to Physical Device Mapping Architecture
- ❁ Semantic Model Architecture
- ❁ Protocol Independent Device and Service Architecture
- ❁ Semantic Based Globalization and Localization
- ❁ Native Code Based Engineering
- ❁ Secure, Preemptive, Fully Protected, Event Driven, Asynchronous
- ❁ Managed Cost of Transaction



# COGS Existing Applications

- ❧ IoT Applications
- ❧ Smart Home Control System
- ❧ Smart Appliances & Electronics
- ❧ Audio Visual Applications
- ❧ Manufacturing Applications
- ❧ Utility Scale Applications
- ❧ Excess Renewable Energy to Bitcoin Converter
- ❧ Digital Power Conversion
- ❧ Green House Environmental Controller
- ❧ Backend Servers
- ❧ Additive Manufacturing
- ❧ Virtual Reality Applications
- ❧ Machine Learning Applications
- ❧ Process Control Systems
- ❧ Automated Inspection
- ❧ Computer Vision
- ❧ CBAM 3D Printing
- ❧ HDMI-CEC/HDTV/Digital Audio OTT set top box
- ❧ Internet streaming and netcasting capabilities
- ❧ Virtual television
- ❧ Radio networks
- ❧ Channel services





# COGS - HA

## *Home Automation*

# COGS HA - Home Automation



 COGS HA provides autonomous, customizable and interoperable IoT software for appliance and consumer electronic manufacturers.

 COGS HA connects an OEM product to the consumers entire smart home IoT ecosystem; regardless of the consumers choice of device, platform or protocol.



Replace the expensive, error prone, manual, legacy process of developing application programs using application program interfaces and application programmers, with an easy to use, secure, reliable, efficient and cost effective automated system.

# COGS HA - Interoperability

 COGS HA brings smart automation, environmental and entertainment control to any manufacturer, in any language, for any region, device, service, protocol, and platform, with no user application programming required.

 COGS HA offers full interoperability and cross-platform compatibility and an unlimited ability to scale.



*“Until interoperability is solved, consumers will have difficulty choosing smart home devices and systems.”*

**Source: Business Insider Report**



# COGS HA - Autonomous & Scalable

 COGS can work autonomously for real-time applications, no internet or cloud services required.

 COGS entirely eliminates monthly recurring cloud costs.

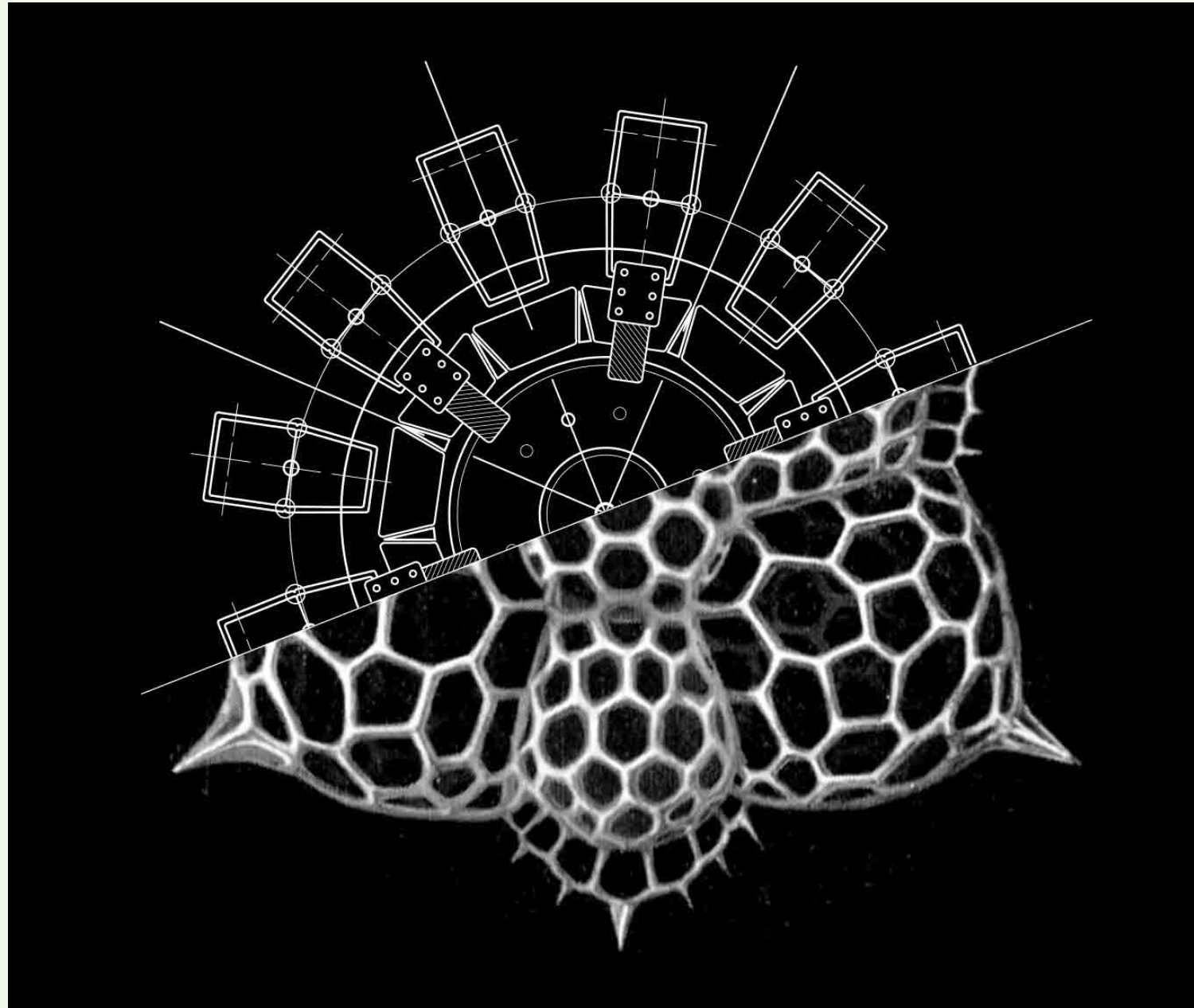
 COGS scalability means large numbers of autonomous platform based products are able to reliably coordinate their actions towards a common set of shared goals, without requiring a scaling up of centralized server resources.



Everything Works Better  
when  
Everything Works Together

# COGS HA - Key Features and Benefits

- ❁ Built in ReST API
- ❁ HTML/CSS/Javascript User Interface
- ❁ Modular protocol device and service drivers
- ❁ Kernel requires less than 500K
- ❁ Suitable for endpoint embedding
- ❁ Suitable as kernel for utility scale, distributed, cloud service deployment
- ❁ Maximizes performance of multi-core hardware
- ❁ Fixed development cost
- ❁ Reduced time to market
- ❁ Managed development risk
- ❁ An autonomous virtual agent
- ❁ Supervised machine learning
- ❁ Decision management
- ❁ Robotic process automation
- ❁ Natural language generation
- ❁ Secure interoperation with IoT ecosystem
- ❁ No programming required
- ❁ Full interoperability
- ❁ Cross-platform compatibility
- ❁ Cross-region, multi-language user interface
- ❁ Fully reentrant and rom-able run-time

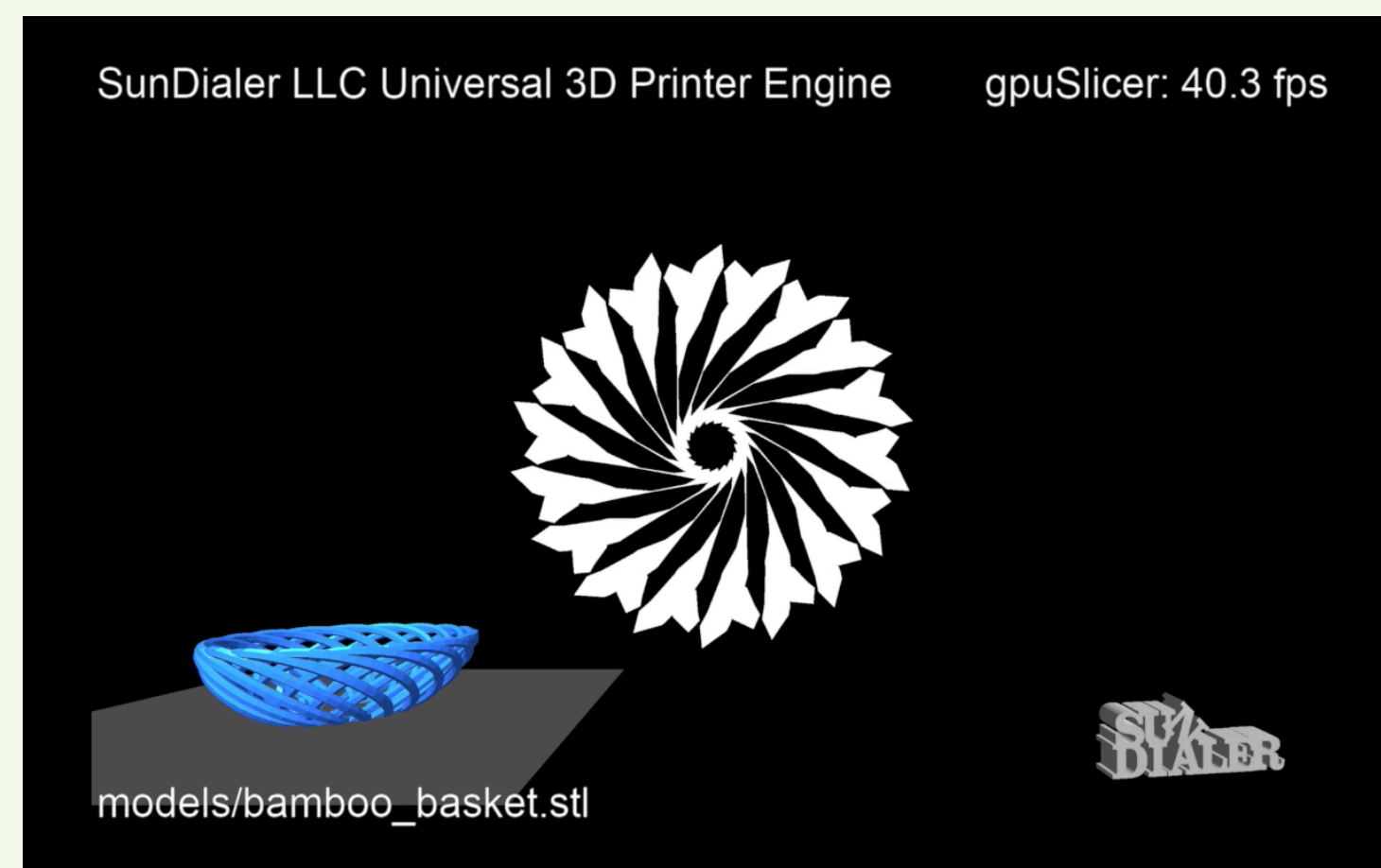


 COGS AM  
*Additive Manufacturing*



# COGS AM - Additive Manufacturing

The term Additive Manufacturing (AM) encompasses many technologies including subsets like 3D Printing, Rapid Prototyping (RP), Direct Digital Manufacturing (DDM), layered manufacturing and additive fabrication.



SLA – 3D printing utilizing high end high laser technology to cure layer upon layer of photopolymer resin (polymer that changes properties when exposed to light)

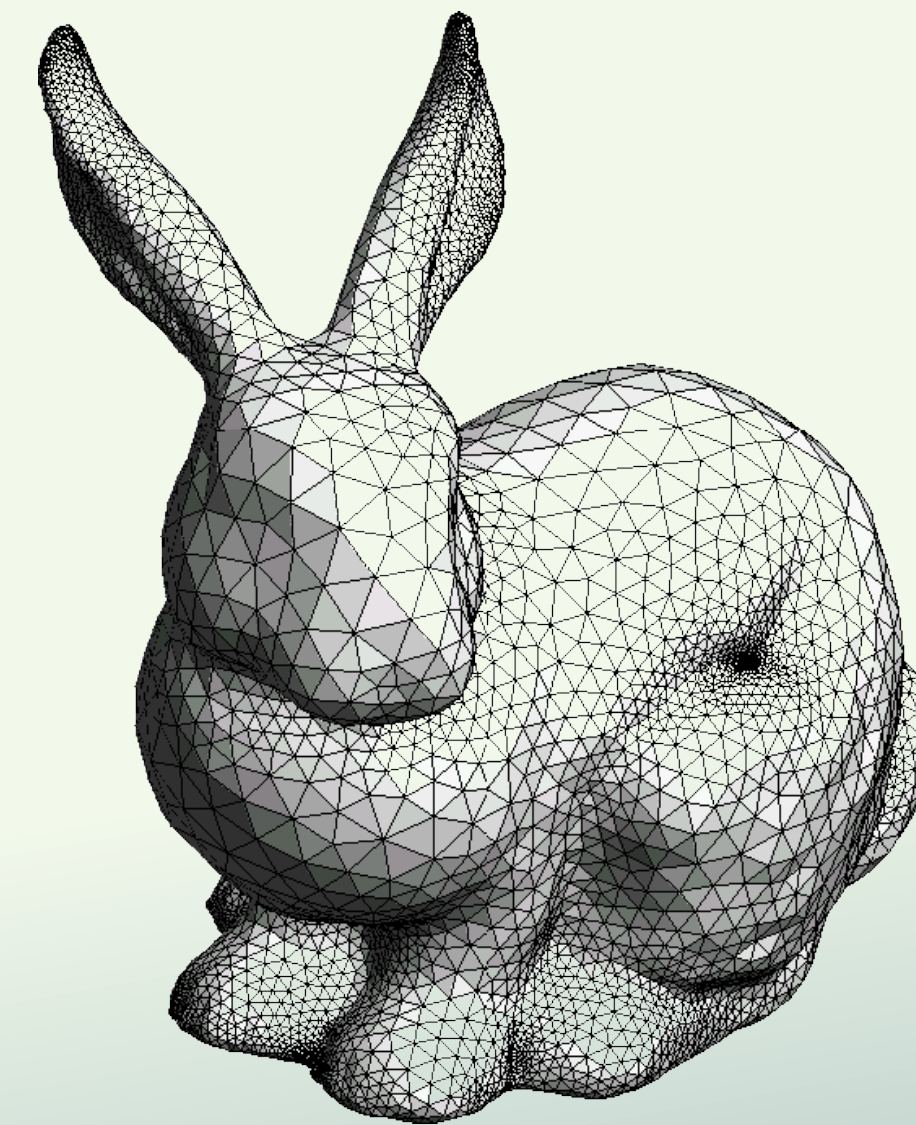
CBAM – 3D printing of continuous carbon fiber composites; polymer is printed onto a fiber sheet and repeated per layer until the model is complete.

 COGS AM provides all the required software components for successful 3D printing.

# COGS AM - SLA

Stereolithography (SLA or SL; also known as stereolithography apparatus, optical fabrication, photo-solidification or resin printing) is a form of 3D printing technology used for creating models, prototypes, patterns, and production of parts.

- ❧ Product Modeling
- ❧ Prototyping
- ❧ Individual or Industrial Scale
- ❧ Customization
- ❧ Durability
- ❧ Freedom of Design



*"3D printing and additive manufacturing can be counted among the most disruptive technologies of our age, and they are predicted to be at the forefront of the fourth industrial revolution."*

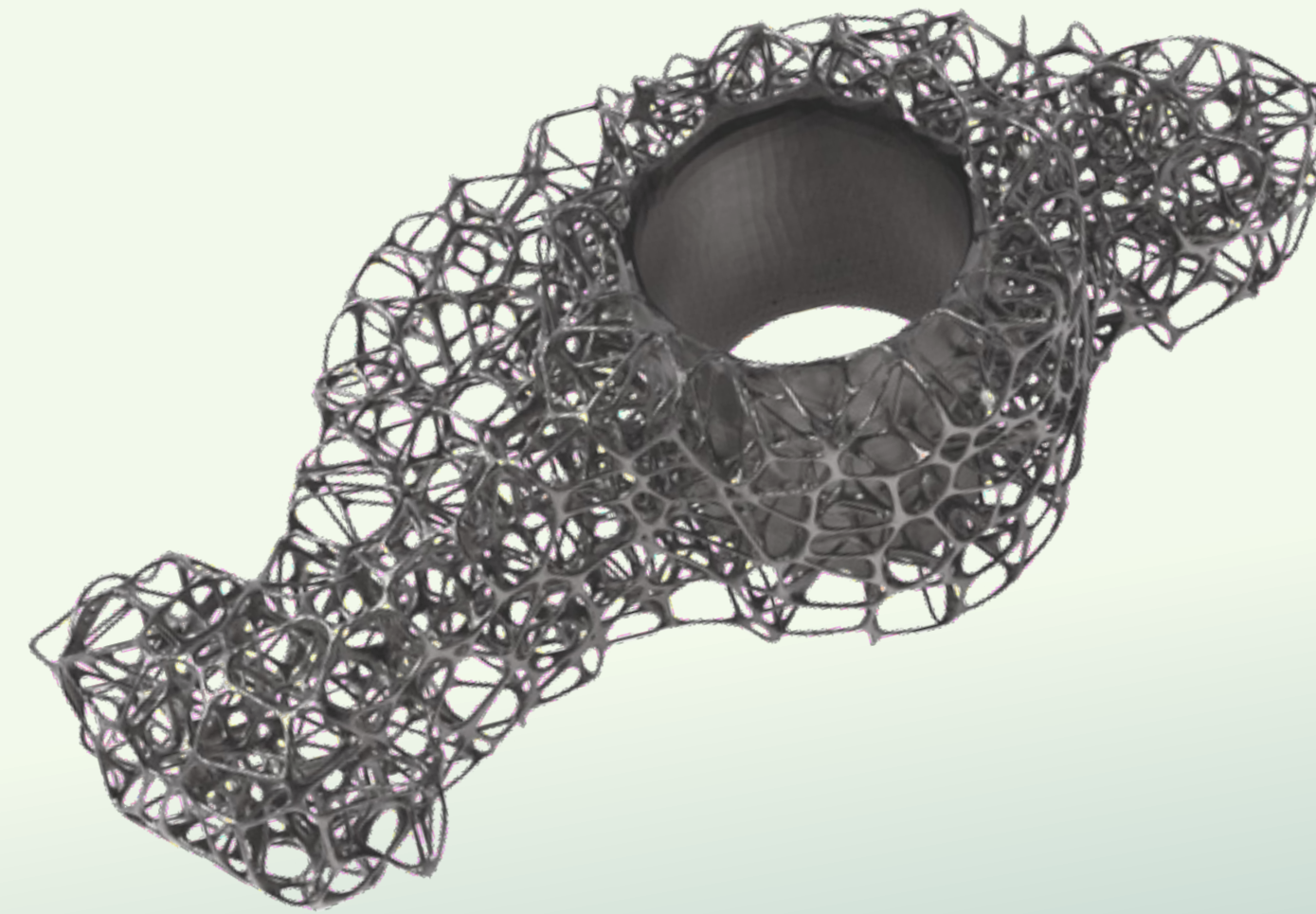
statista.com



# COGS AM - CBAM

Composite-based additive manufacturing technology – CBAM – delivers stronger parts, at faster speeds and from a wider range of materials. CBAM can replace expensive, time-consuming conventional techniques like machining, tooling, and injection molding, while offering greater geometric complexity.

- ❧ Strong yet Lightweight
- ❧ No Tooling Costs
- ❧ Rapid Production
- ❧ Customization
- ❧ Durability
- ❧ Freedom of Design



*“As this fabrication technology evolves and matures, options for applying it in everything from automotive to aerospace to consumer composites will expand tremendously, creating a host of new opportunities for the composites industry.”*

Ginger Gardiner- CompositesWorld, August 3, 2016



# COGS AM - Slicing and Inspection

 COGS offers the fastest GPU based slicer and automated inspection software for CBAM and SLA printers. Combined with our advanced process control system... if you can dream it, you can build it.

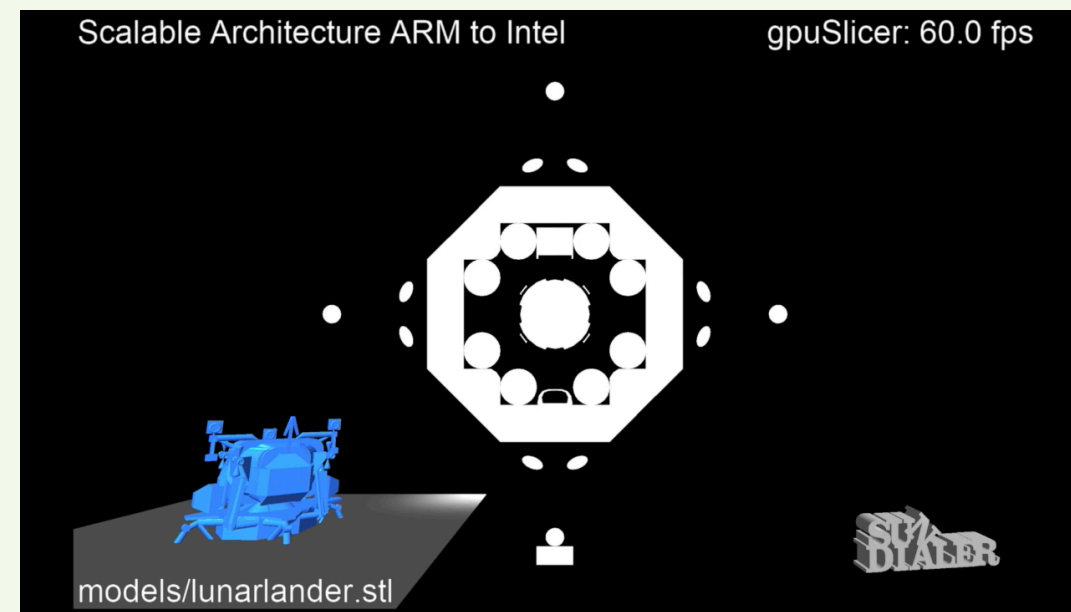


- Operates on Windows, Mac, Linux
- Operates in real-time, averaging 60 frames per second
- Completely scalable to project size
- Maximizes performance of multi-core hardware
- Hardware independent
- Cross-region, multi-language interface
- No user application programming required

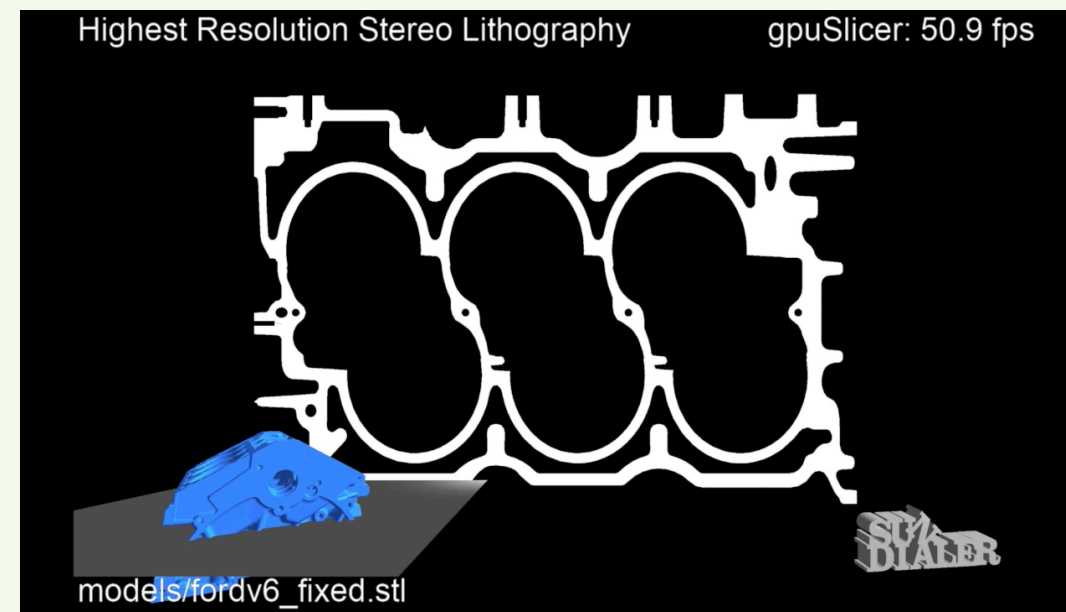
*“The global market for 3D printing and services is expected to grow to almost 50 billion U.S. dollars by 2025.”*

statista.com

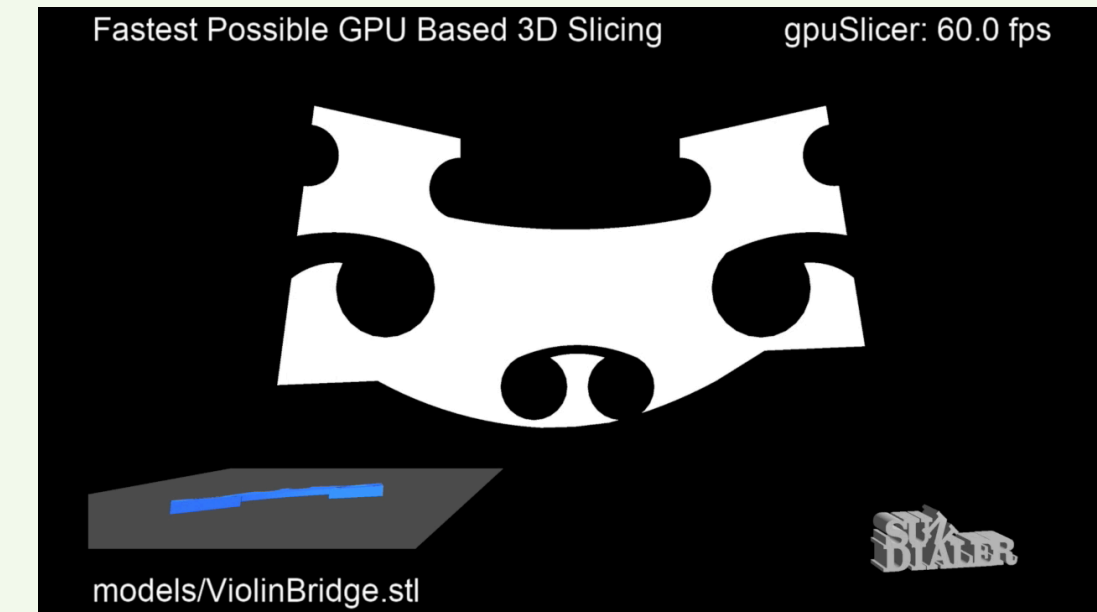
# COGS AM - Universal 3D Printer Engine



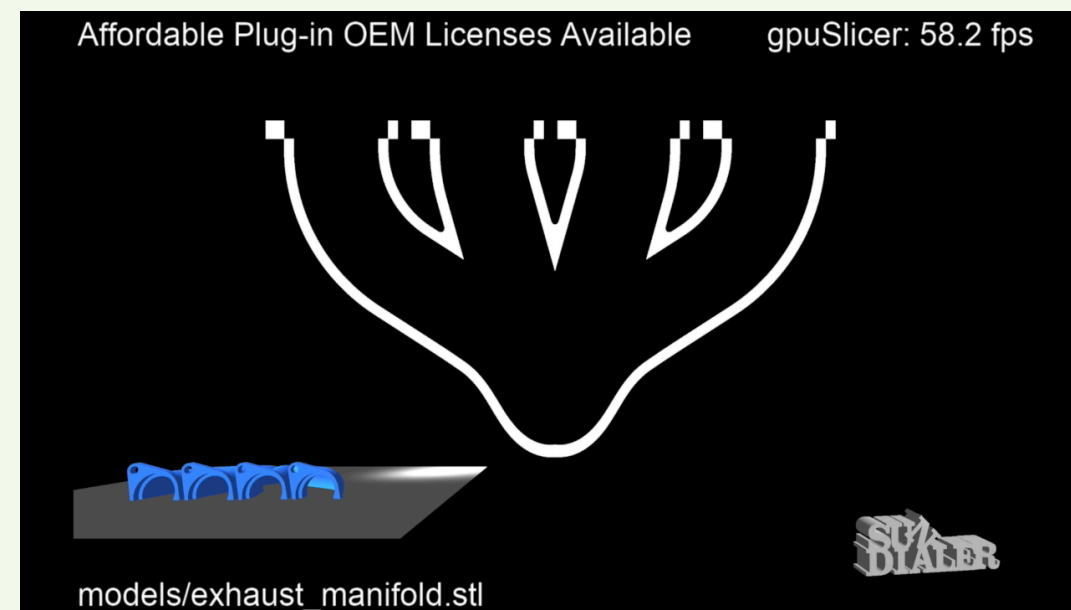
Scalable Arm to Intel



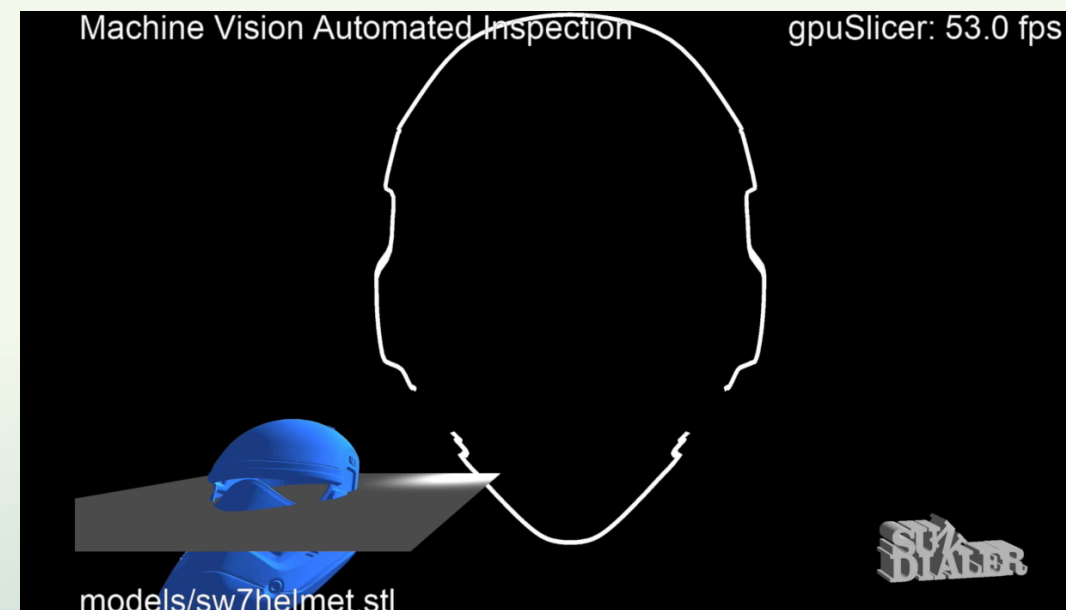
Highest Resolution Stereo Lithography



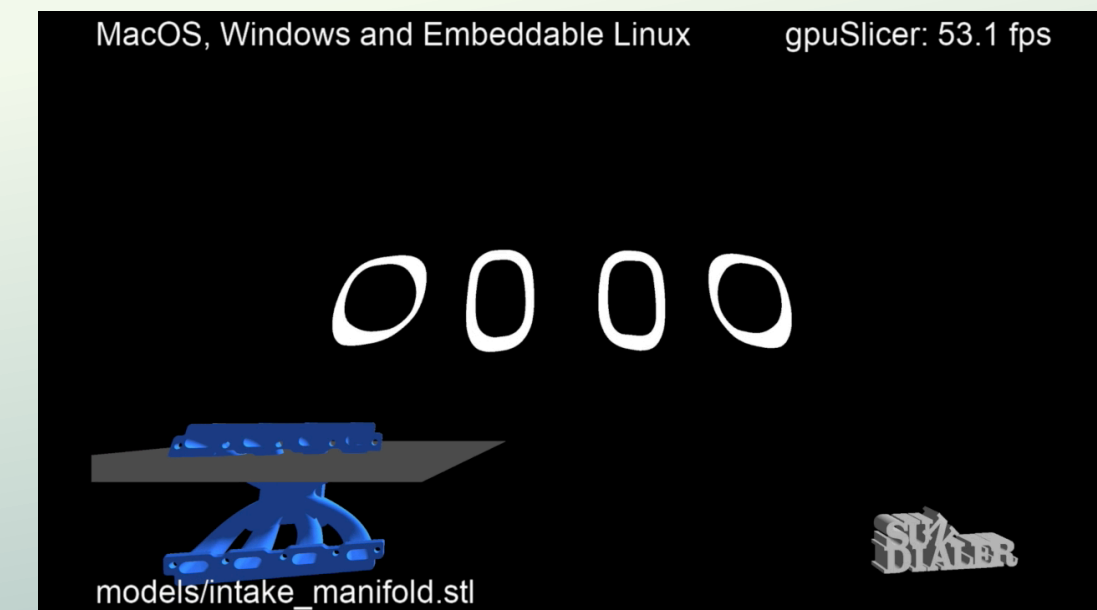
Fastest Possible GPU Slicer



Print VR and AR

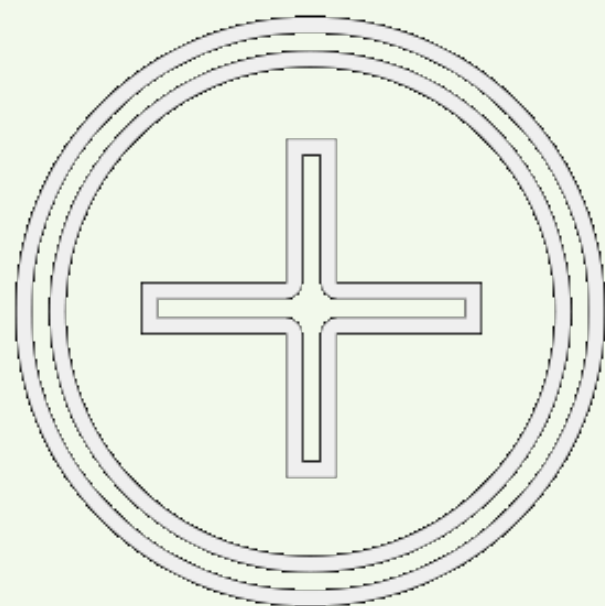


Machine Vision & Automated Inspection

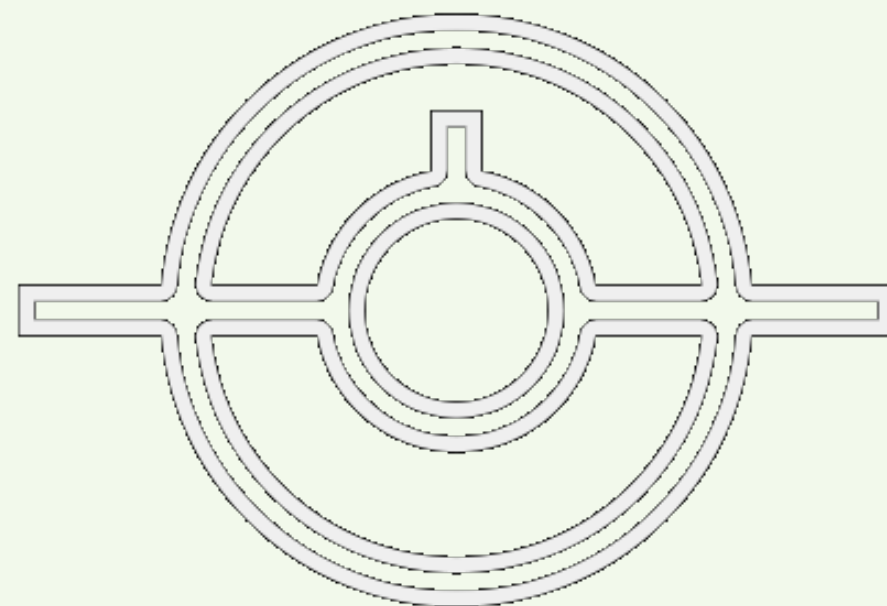


MacOS, Windows and Linux

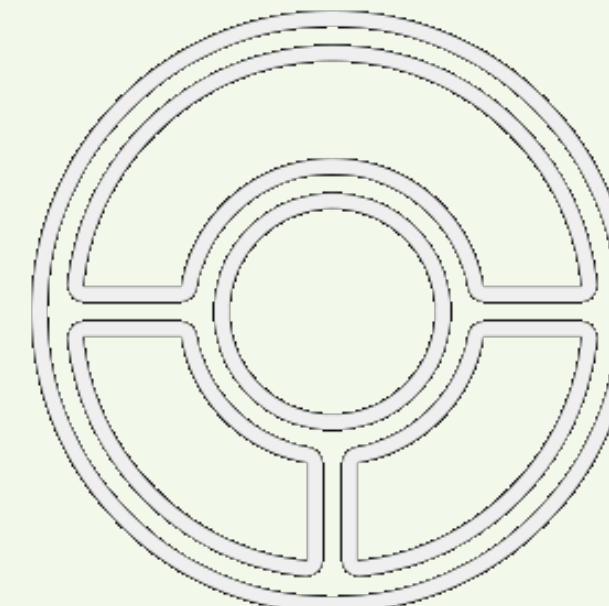
# COGS AM - Industries



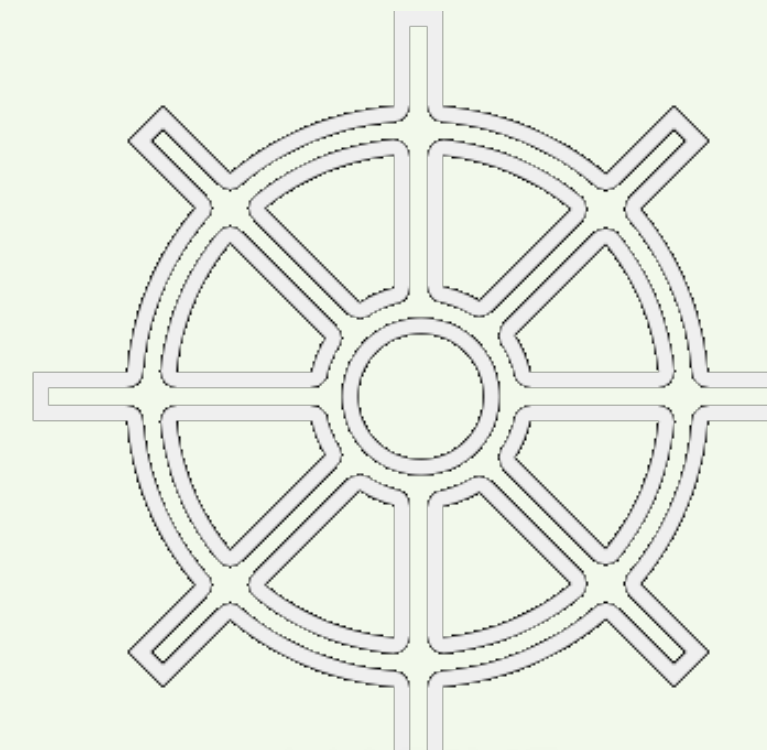
HEALTHCARE



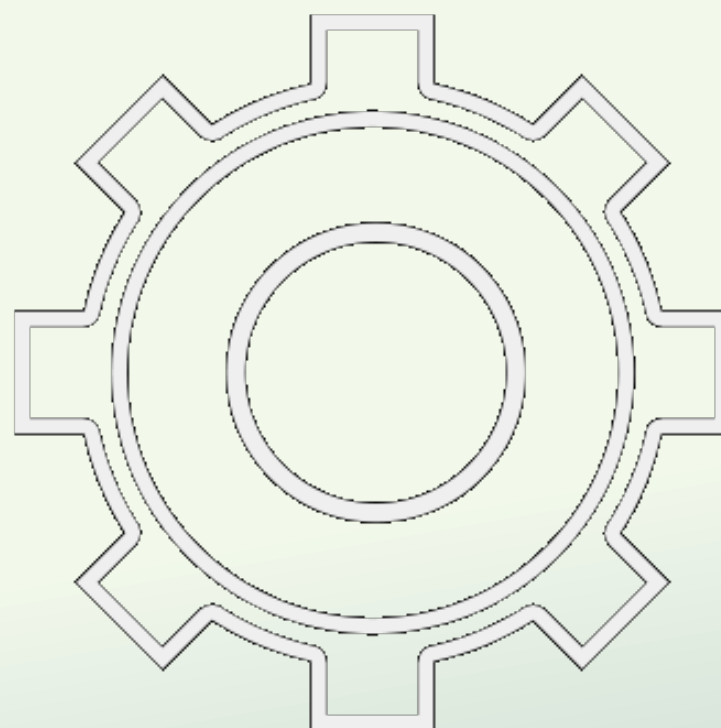
AVIATION



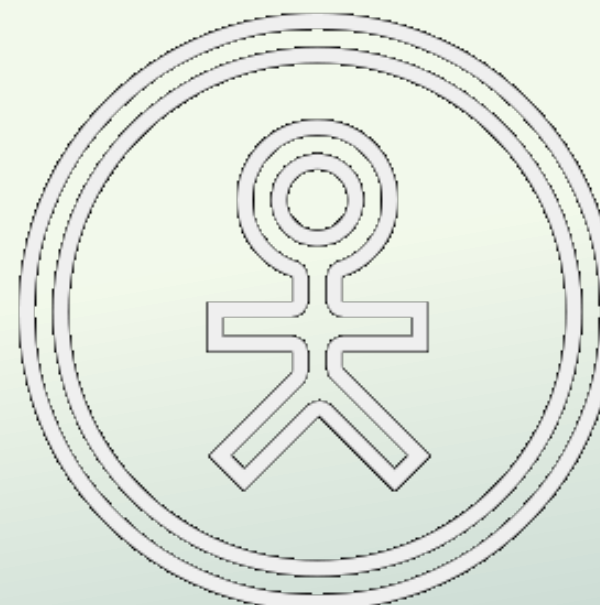
AUTOMOTIVE



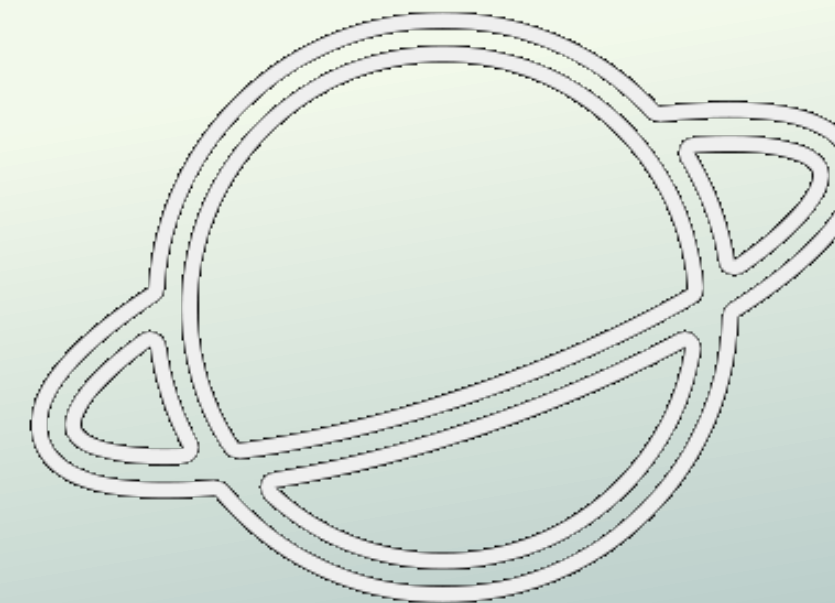
MARINE



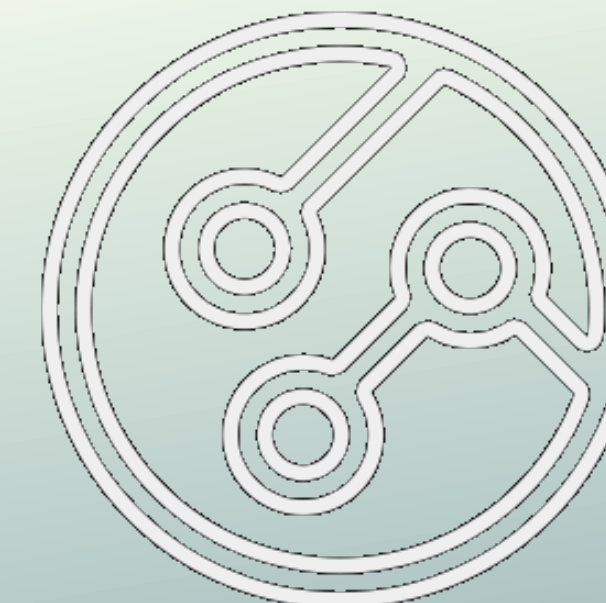
INDUSTRIAL



ATHLETICS

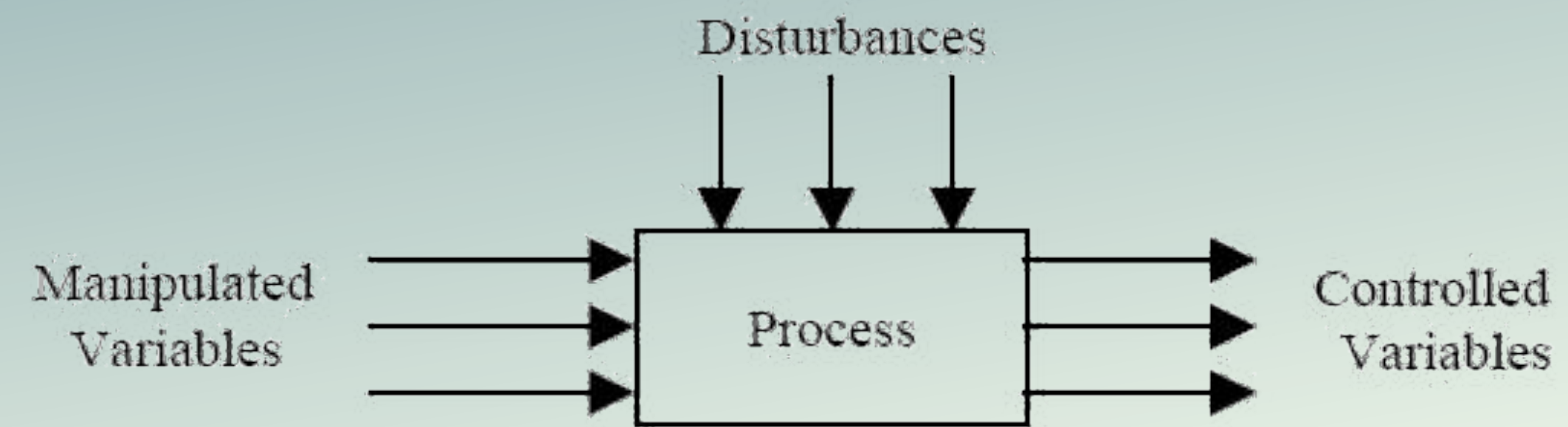


AEROSPACE



ROBOTICS



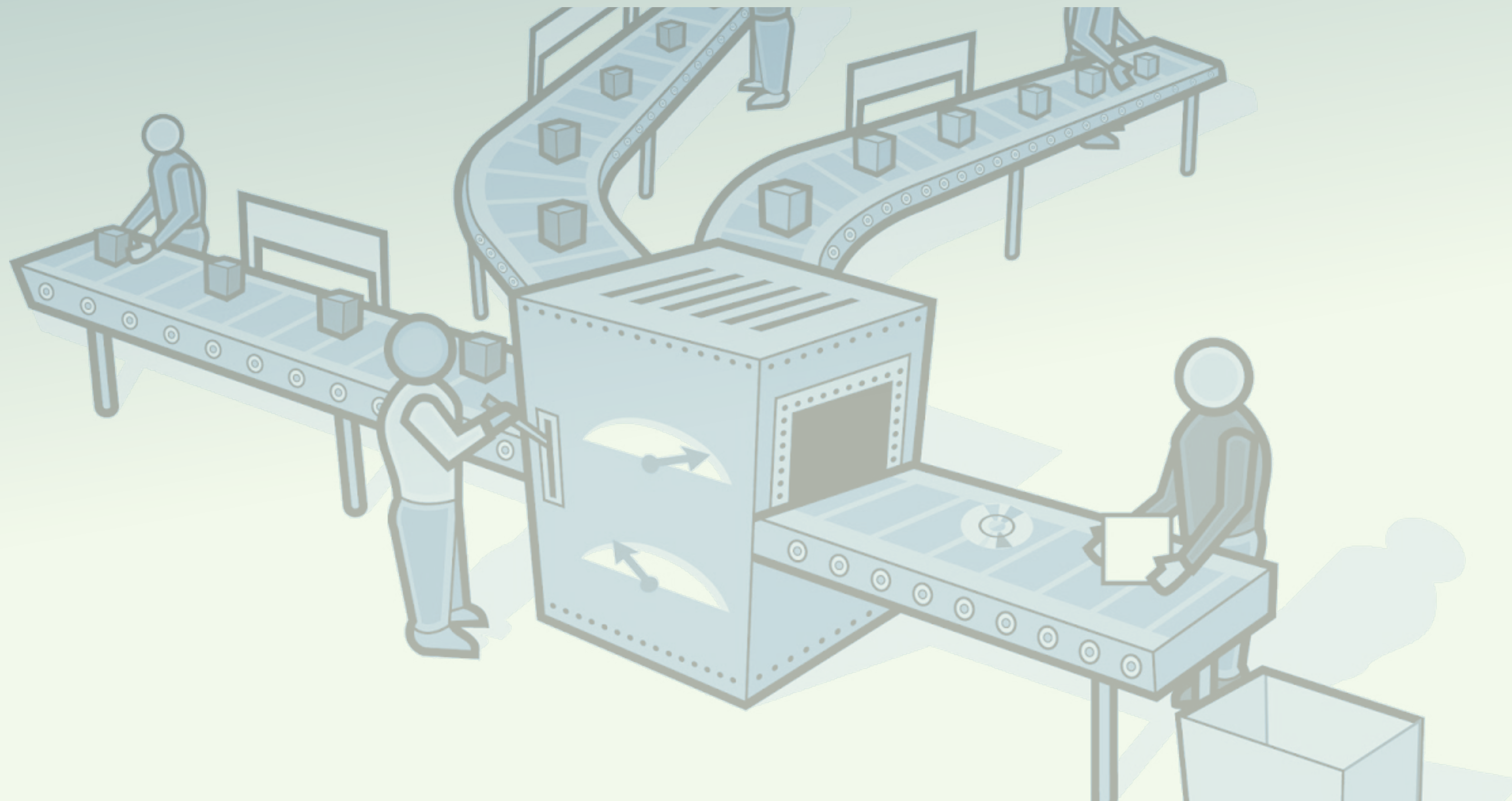


# COGS PC

## *Process Control*

# COGS PC- Process Control

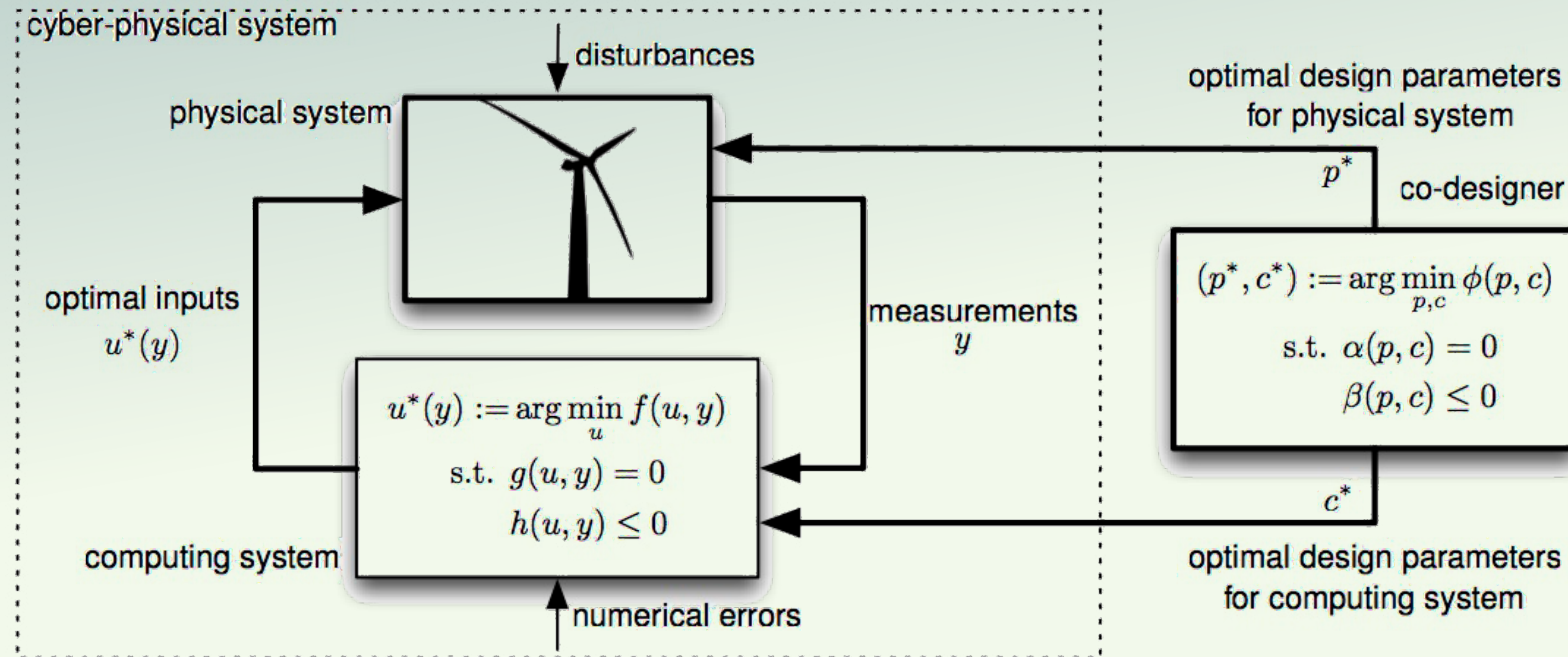
Automatic process control enables a small number of operators to manage complex processes to a high degree of consistency, economy and safety, which could not be achieved purely by human manual control.





# ⚙️ COGS PC - Made Easy

⚙️ COGS advanced technology provides imaging-based inspection and analysis for such applications as automatic inspection, process control, and robotic guidance.







 COGS CV  
*Computer Vision*

# COGS CV - Computer Vision

Computer Vision is a subfield of engineering that incorporates:

- Computer Science
- Optics
- Mechanical Engineering
- Industrial Automation

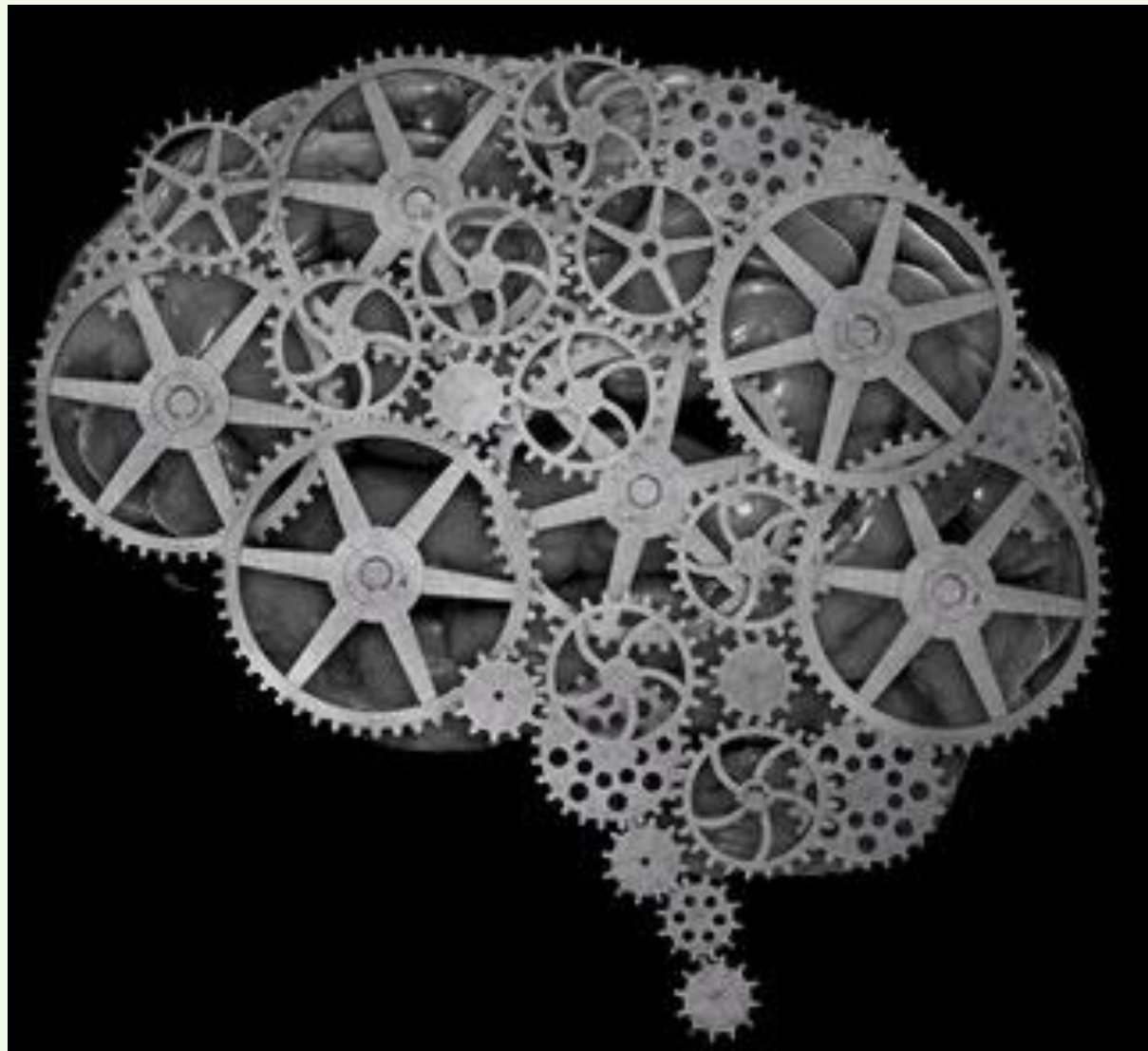
 COGS uses cameras and scanner sensors and processing hardware, along with our advanced software platform, to automate visual inspection tasks and precisely guide handling equipment during product assembly.

# COGS CV - Recognition and Inspection



- ❁ Electronic Component Analysis
- ❁ Signature Identification
- ❁ Optical Character Recognition
- ❁ Handwriting Recognition
- ❁ Object Recognition
- ❁ Pattern Recognition
- ❁ Materials Inspection
- ❁ Currency Inspection
- ❁ Medical Image Analysis





 COGS ML  
*Machine Learning*

# COGS ML - Machine Learning

 COGS ML is an autonomous, scalable, interoperable, secure, reliable, cross-platform, cross-region, multi-language application platform.

 COGS ML architecture is composed of four major parts:

-  Universal Device Interface
-  Universal Service Interface
-  Universal User Interface
-  Cognitive Application Kernel

The individual components of each of these parts are multiple, reentrant, asynchronous processes, functioning as an automatically scaling, data-flow pipeline optimized for low power, multi-core processors and low latency applications.

# COGS ML - Industries

## Automotive

- ✿ guiding robots, checking parts, identifying codes, inspecting quality

## Electronics

- ✿ inspecting components, boards and connectors, verifying solder, tracking lots

## Flatpanel inspection

- ✿ verifying parts, assemblies and packaged goods

## Food & Packaging

- ✿ verifying seals, grading products, reading labels

## Manufacturing

- ✿ verifying parts, assemblies and packaged goods

## Semiconductor

- ✿ finding defects, tracking faults

## Solar Cell Inspection

- ✿ finding cracks and flaws

## Web Inspection

- ✿ tracking production parts, reading and verifying product lots and codes

## Non-Destructive Testing

- ✿ verifying connections, weld quality

## Print Inspection

- ✿ finding defects, faults

## Postal

- ✿ OCR, image lift, sorting





 COGS DP  
*Digital Power*

# COGS DP - Digital Power

Digital power is the conversion of surplus analog and/or renewable power to cryptocurrency. Digital power offers substantial benefits for the generation, transmission and storage of electricity.

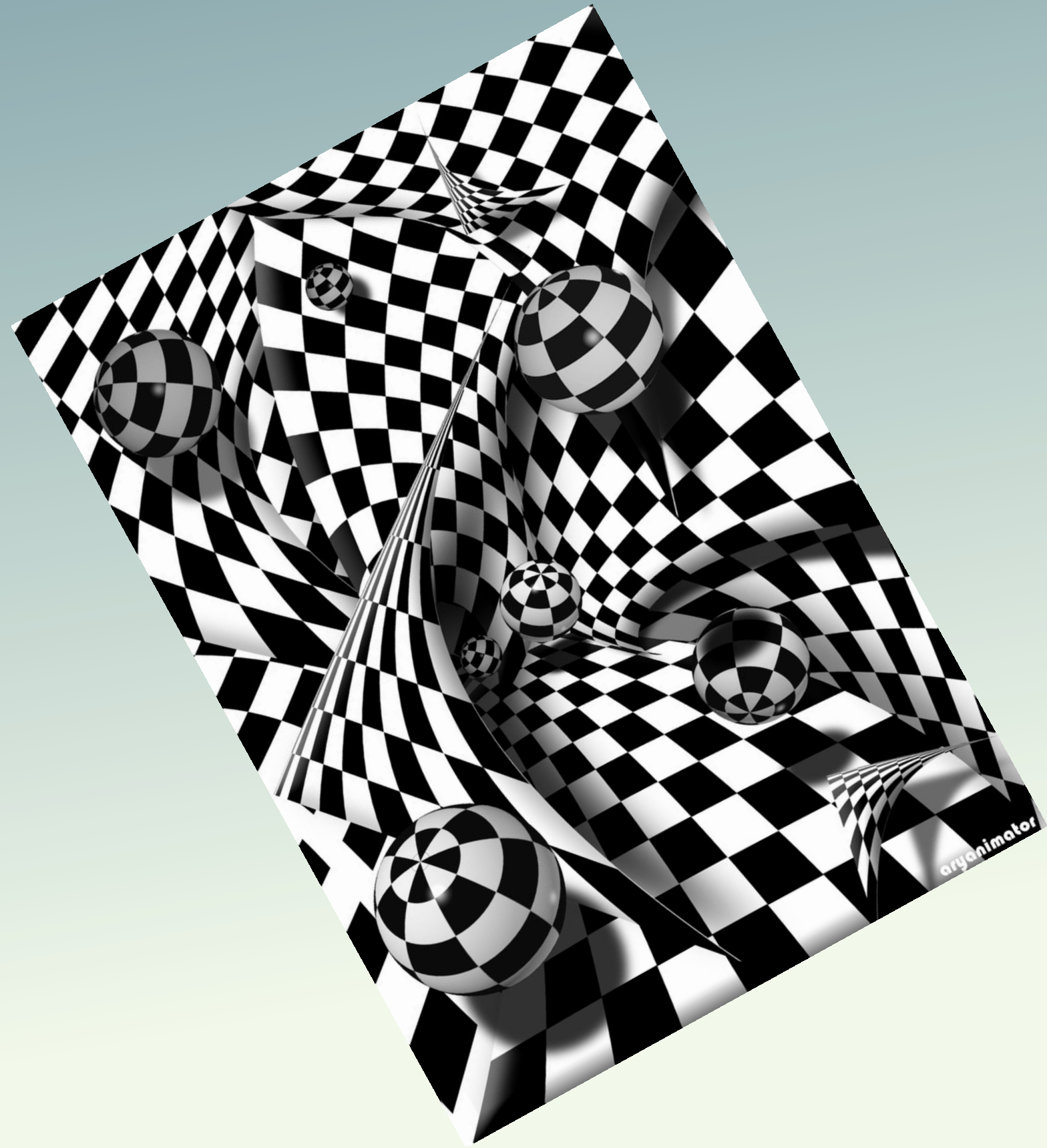
- Stores almost indefinitely
- Transmits over any distance
- Reduces engineering complexities
- Eliminates grid disruptions from the ebb and flow of renewables
- Provides additional value through arbitrage between the cost of 1KWH and 1AKWH
- Eliminates feed in tariff (FIT) curtailment losses and profit from net electric metering (NEM)
- Eliminates curtailment losses and turns them into a new recurring income channel
- Can be sent from virtually anywhere in the internet connected world to virtually anywhere else
- Removes the need for an unreliable two way grid
- Offsets spinning reserve fuel costs

# COGS DP - The Future of Power



-  COGS DP advanced architecture and scalability brings the ability to easily convert surplus energy to bitcoin or other cryptocurrency, either on an individual home basis or through a major power provider.
-  COGS DP removes the requirement of batteries, or hydro electric dams, making storing electricity safe and easy, regardless of the scale.
-  COGS DP incurs only a 1% loss – no matter how far it travels or how long it is stored.
-  COGS DP byproduct is only heat.
-  COGS DP transmission uses existing infrastructure.





# COGS VR

## *Virtual Reality*

# COGS VR- Virtual Reality

Virtual Reality - the computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way.

 COGS VR offers users the ability to create their own virtual realities - in real time.



- Virtual Games
- Virtual Worlds
- Virtual Designs
- Virtual Websites
- Virtual Exercises
- Virtual Layouts and Representations
- Virtually Anything





# COGS VR- Full Support

- ❁ Supports all protocols and manufacturers
- ❁ Supports all cloud protocols and services
- ❁ Supports all geographical languages and regions
- ❁ Supports all client devices including mobile, desktop, smart television products, iOS, Android, MacOS, Windows and Tizen
- ❁ Eliminates the need for hand coded “Smart Apps” written by multiple programmers in any number of arbitrary programming languages
- ❁ Eliminates the need for expensive remote cloud service
- ❁ Reduces users costs by using low latency optimized code, low energy and fewer system resource requirements
- ❁ Is hardware independent

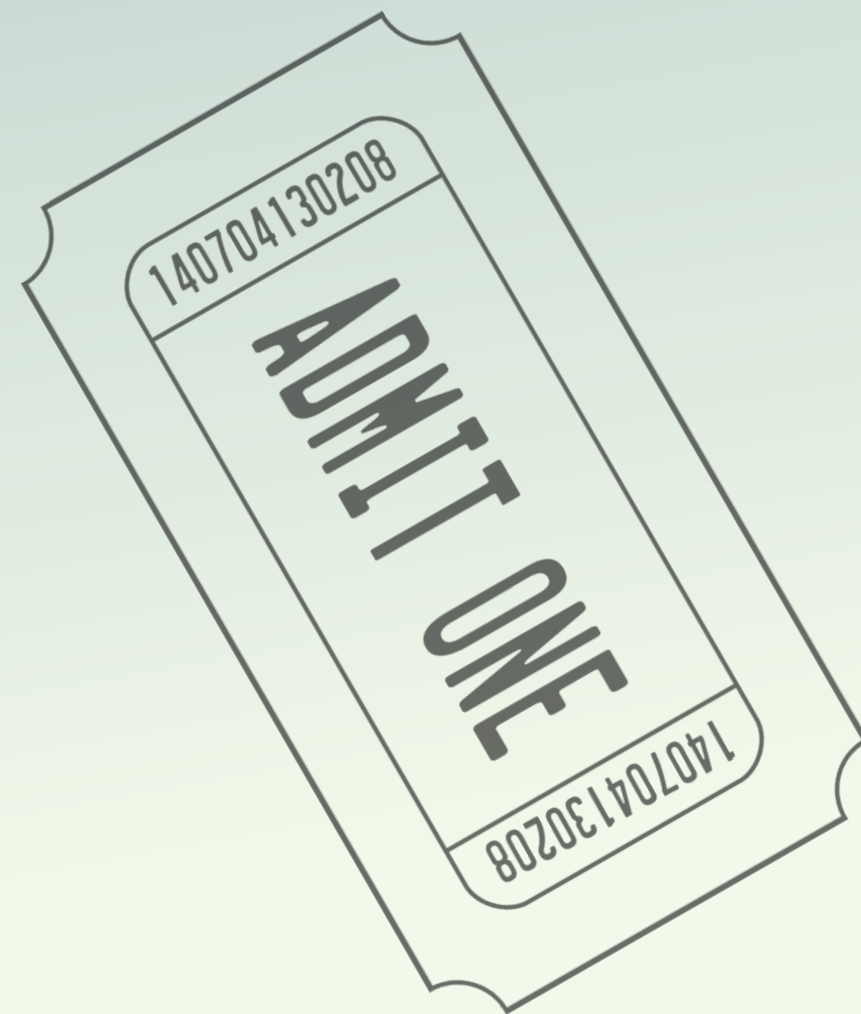




 COGS AV  
*Audio Visual*

# COGS AV - Curated Music, Motion Picture and Video

 COGS Over-the-Top (OTT) set top box plugs into any empty HDMI port, in any television, anywhere in the world, and allows broadcasters to distribute their channel-based audio and media content, along with sponsored commercial advertisers, over the internet. More affordably and to more targeted markets around the world than ever before.



- ✿ The ability to record the highest quality music from the worlds most popular musicians
- ✿ Provide for both satellite and terrestrial broadcast AND global netcasting over the internet via the  COGS OTT set top box
- ✿ A single global infrastructure for audio and video delivery and distribution

*It's time to go old school with new tech*



# COGS AV - Return of the DJ

The infinite sea of unlimited movies, television programs and music, and the endless and frustrating process of leafing through catalogs of unwatchable content, will be replaced (if not supplemented) by curated television channels and radio stations, operated by individually relatable and trusted DJs.



- ✿ Ability for Broadcasters to set up their own channels
- ✿ Professionally crafted channels with individual personalities - that any age demographic can trust
- ✿ Content discovery through DJ - satisfying the expanding demand for curated content
- ✿ Utilize exactly the same model as the broadcast business, with the exception that instead of going over AM/FM or VHS frequencies, in a specific region, it goes over the unlicensed internet - anywhere in the world.



# COGS AV - Special Effects

- ❁ High quality and non-copiable analog products
- ❁ Complete media control with existing remote
- ❁ Smart phones as FM receivers
- ❁ Emergency broadcast ability
- ❁ Easily integrated value added products and services
- ❁ Streams of commercially sponsored programming
- ❁ Subscription programming
- ❁ Public access programming
- ❁ A user interface no more complex than choosing a curated channel

# Hardware Specs

The SunDialer LLC S1 Hardware Development Kit is the highest performance, most reliable, 100% compatible, Raspberry Pi computer that you can buy. Completely assembled for your convenience and no batteries required.



- ✿ 1.2GHz 64-bit quad-core ARMv8 CPU
- ✿ VideoCore IV 3D graphics core
- ✿ 802.11n Wireless LAN (Wi-Fi)
- ✿ Bluetooth 4.1 Bluetooth Low Energy (BLE)
- ✿ 4 USB ports
- ✿ Full HDMI Port
- ✿ Ethernet port (RJ-45)
- ✿ Combined 3.5mm two channel audio jack and composite video
- ✿ Micro SD card slot, 8GB Micro SD (10) card.

Automation Controller - Home Automation Controller - Environmental Monitoring - Process Controller - Weather Monitor Access Control - Agriculture Controller - Greenhouse Controller - Model Train Controller - Entertainment Controller - Drone Applications...



# References and Resources

## Home Automation

[Internet-of-things-installed-base-by-category/](#)

[lcd-tv-shipments-worldwide-by-vendor/](#)

## Process Control

[Wikipedia](#)

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## Machine Learning

[Industry 4.0](#)

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[Industrial-iot-market-to-drift-north-of-900b-by-2025.html](#)

## Audio Visual

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[The Golden Age of TV Fiction](#)

[You Can't Tickle Yourself - Nature Neuroscience](#)

[Sense Media Digital Netcasting](#)

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[Additive manufacturing.com](#)

[CompositesWorld - CBAM](#)

[Additive Manufacturing and 3D Printing - Statistics and Facts](#)

## Images

[Digital Power - poles](#)

[Digital Power - windmil](#)

[Synthetic Awareness - brain](#)

[Industries](#)

[3D part](#)

[Virtual Reality Illusion](#)

[3DPrinter](#)

[3D Rabbit](#)





# THANK YOU!

SunDialerLLC.com  
sundialerllc@gmail.com  
808.579.9887