

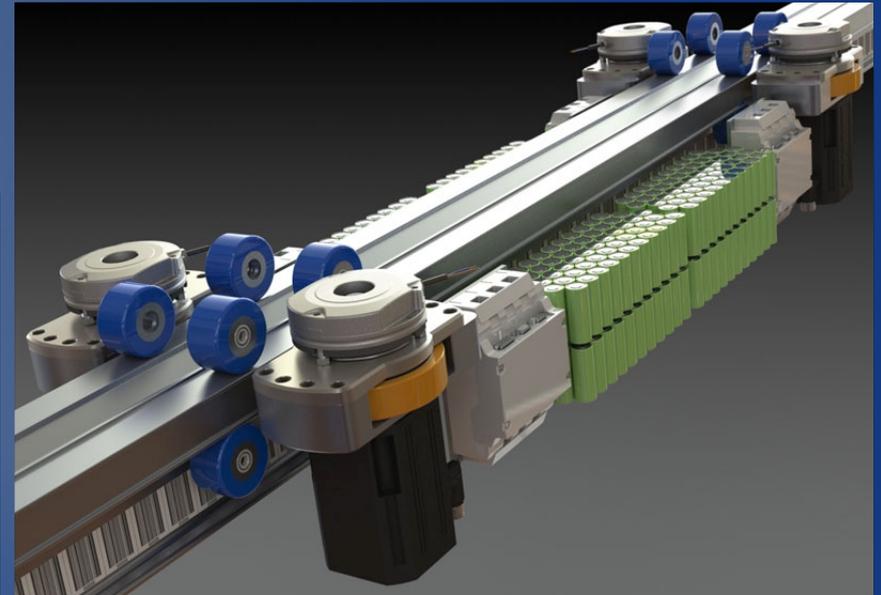
What is Overdrive and what makes it unique?



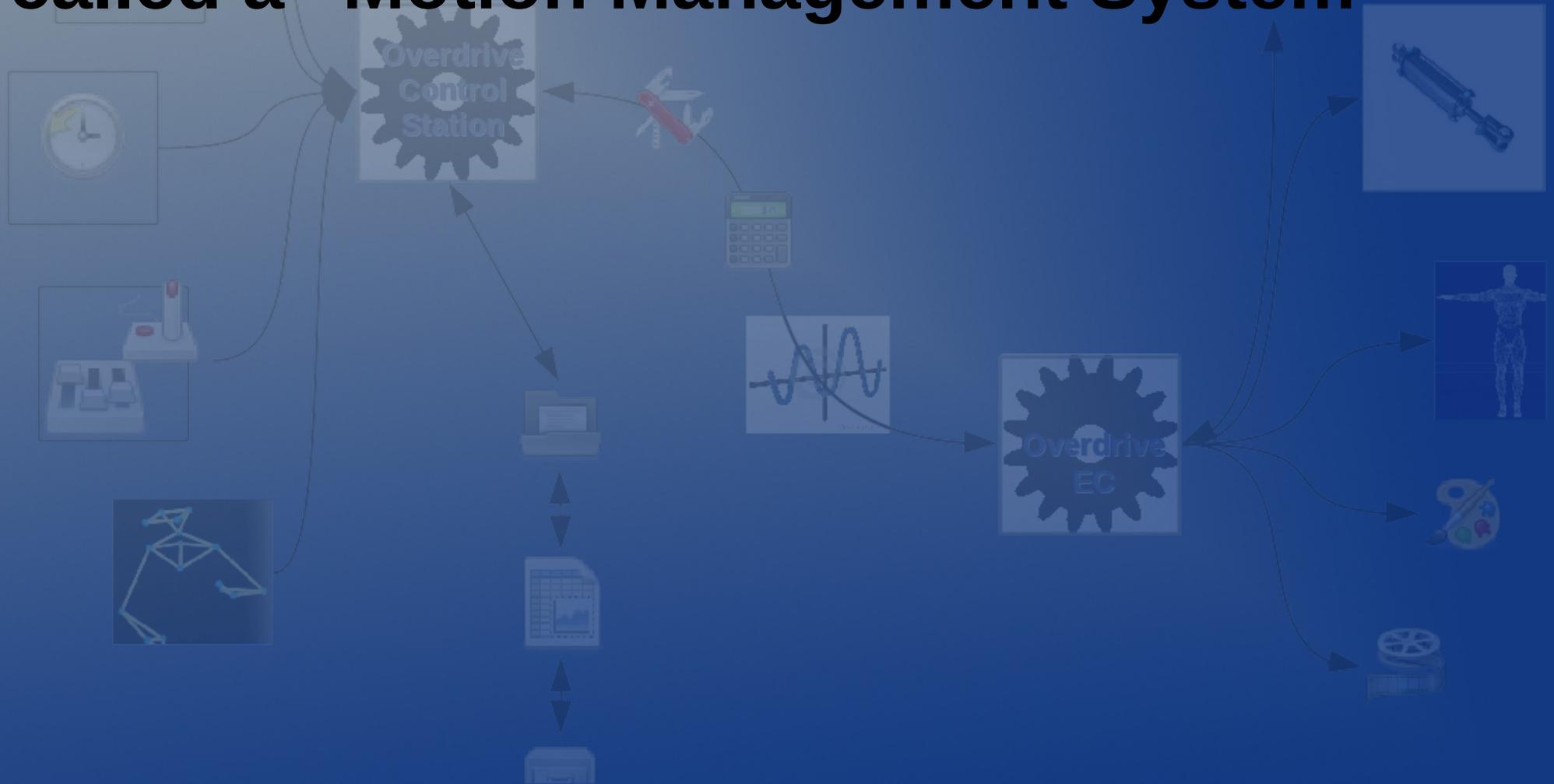
Overdrive is a computer and electronic Motion System



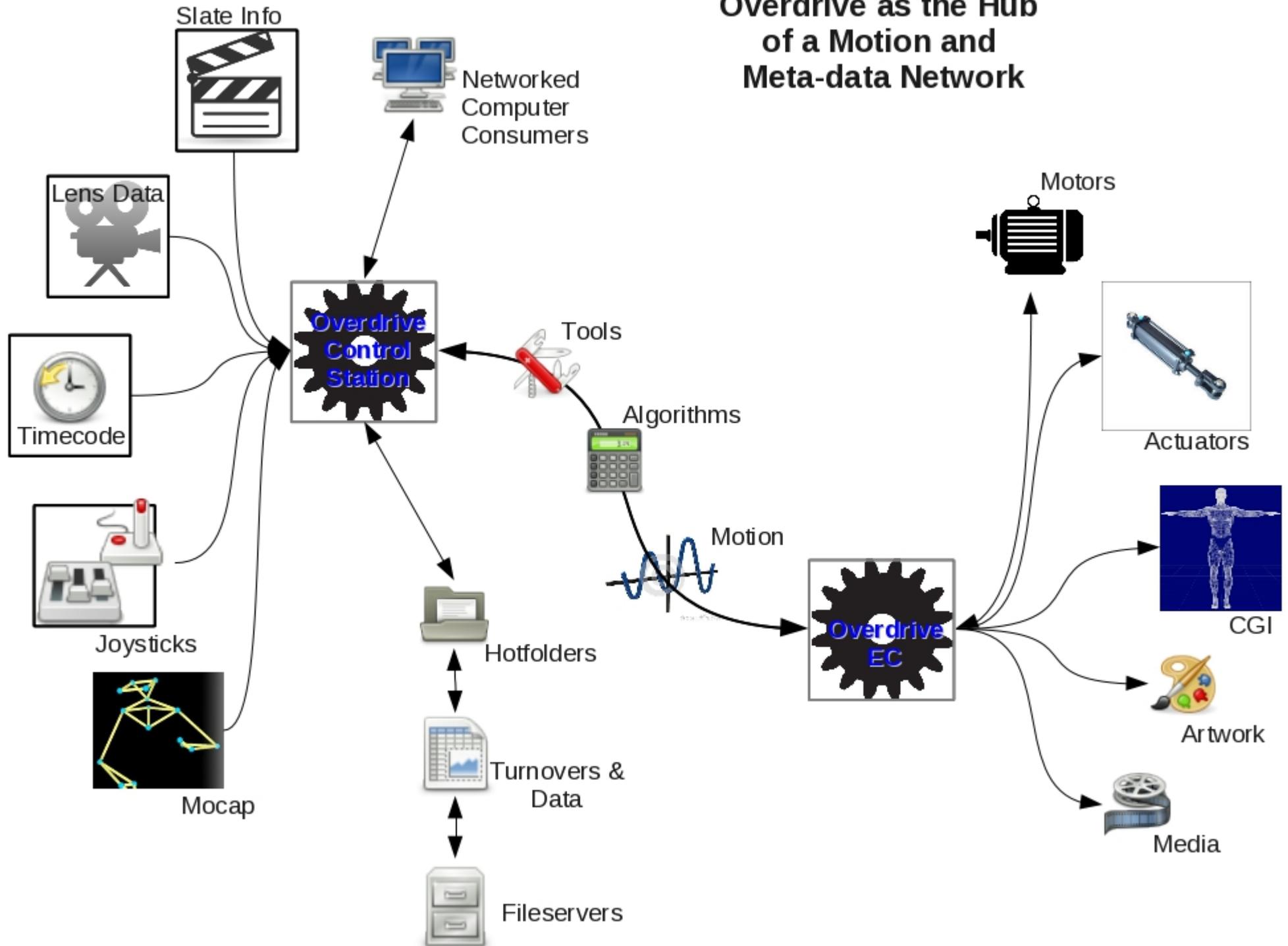
... it moves actuators, like motors and hydraulic cylinders, to achieve robotic control of machines.



Perhaps more importantly,
Overdrive streams pure motion on
networks between many kinds of
devices, which is why it is sometimes
called a “Motion Management System”



Overdrive as the Hub of a Motion and Meta-data Network

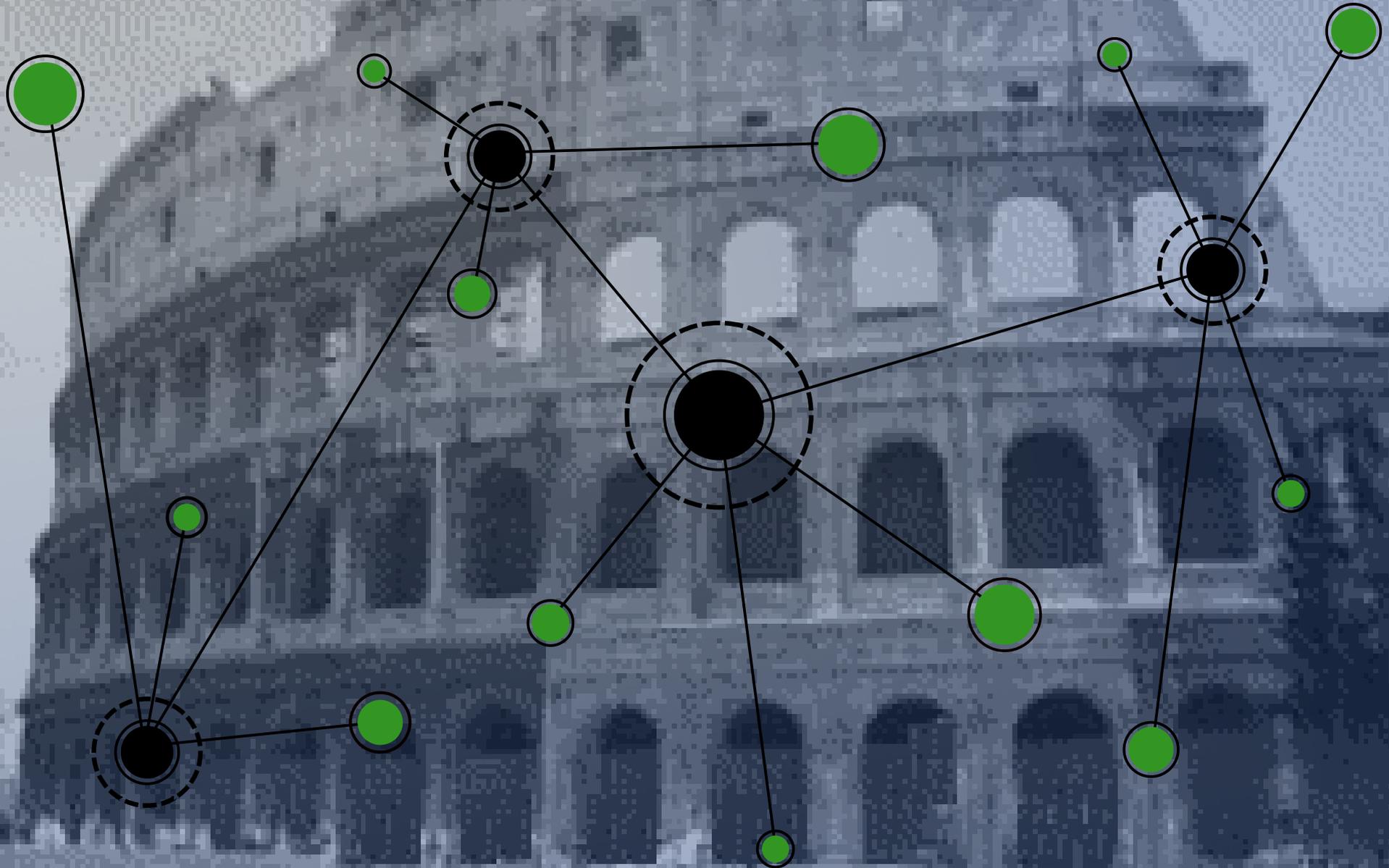


Overdrive captures, stores, and distributes meta-data, take data, & motion data, and combines those datasets for VFX pipelines.

The screenshot displays a VFX pipeline software interface with several key components:

- Spreadsheet:** A table with columns for FQN, Feeds, Shoot Date, Stage Status, Pipeline Status, Edit Timecode In, Edit Timecode Out, Scene Notes, Lens Note, and Focal Length Note. It lists various takes such as 012_kk_0AA_005_0A01_Z1_pc001_v001.
- Motion Data Graph:** A graph showing Mocon_Frame_Count (index:0) and Zoom_Literal_1 (index:1) over time, with a value of 18.1728210832 highlighted.
- Metadata Viewer:** A window displaying technical details for a specific take, including Dir: Steve Synthesis, Artist: synthesis, VFX #: 744 CT0100, and FQName: 043_tk_00E_004_0A01_Z1_pc001_v003.
- File Distribution List:** A list of files and datasets, including README.txt, turnover_[EDL_TITLE]_[TIMESTAMP].csv, original_EDL_file.edl, and datasets like overdrive and synthesis.

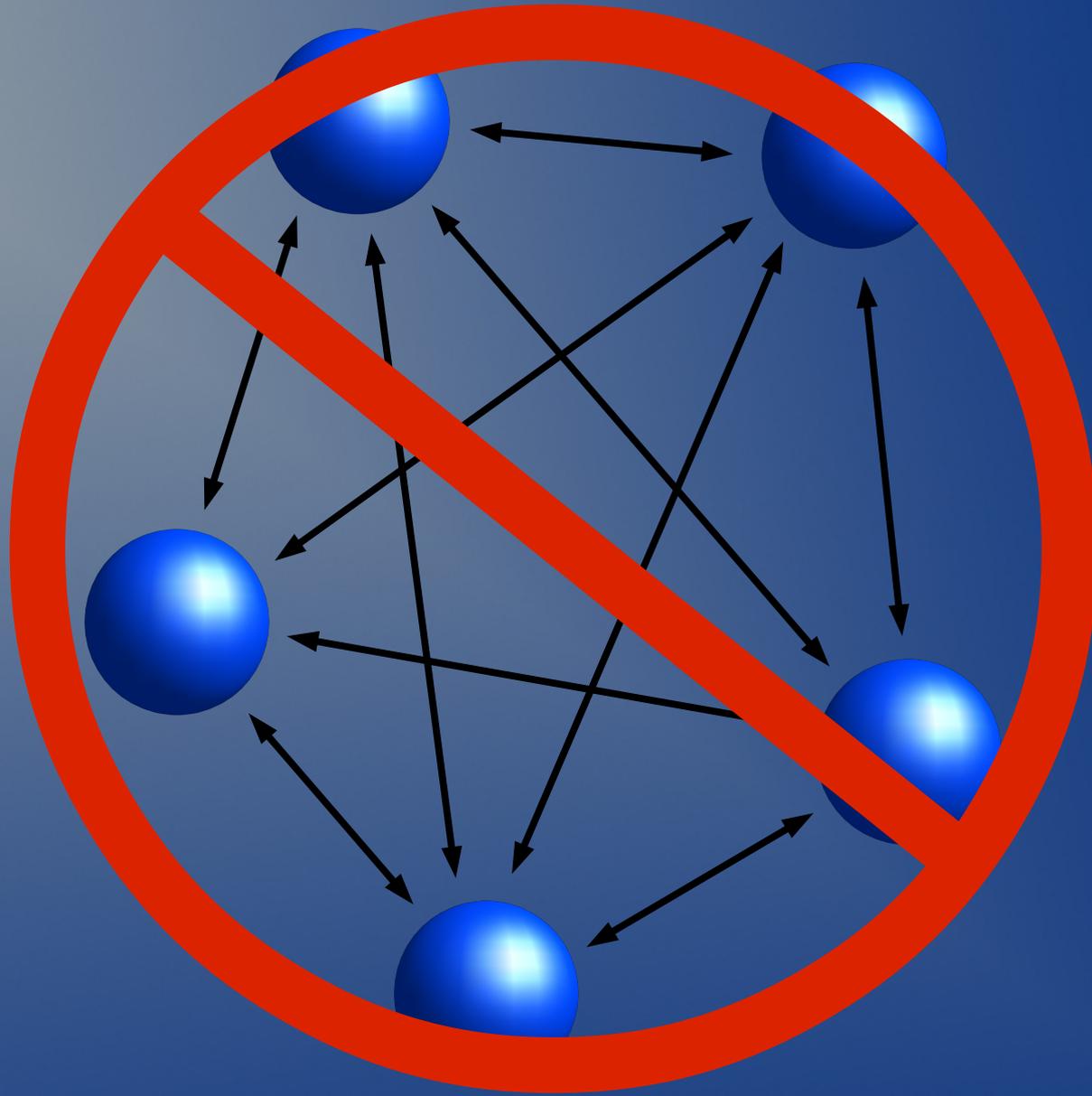
The Architecture is the key...



Traditional TV production tools were single-purpose and limited in scope, by design. They typically connected only two things together, and couldn't handle inter-department interfaces.

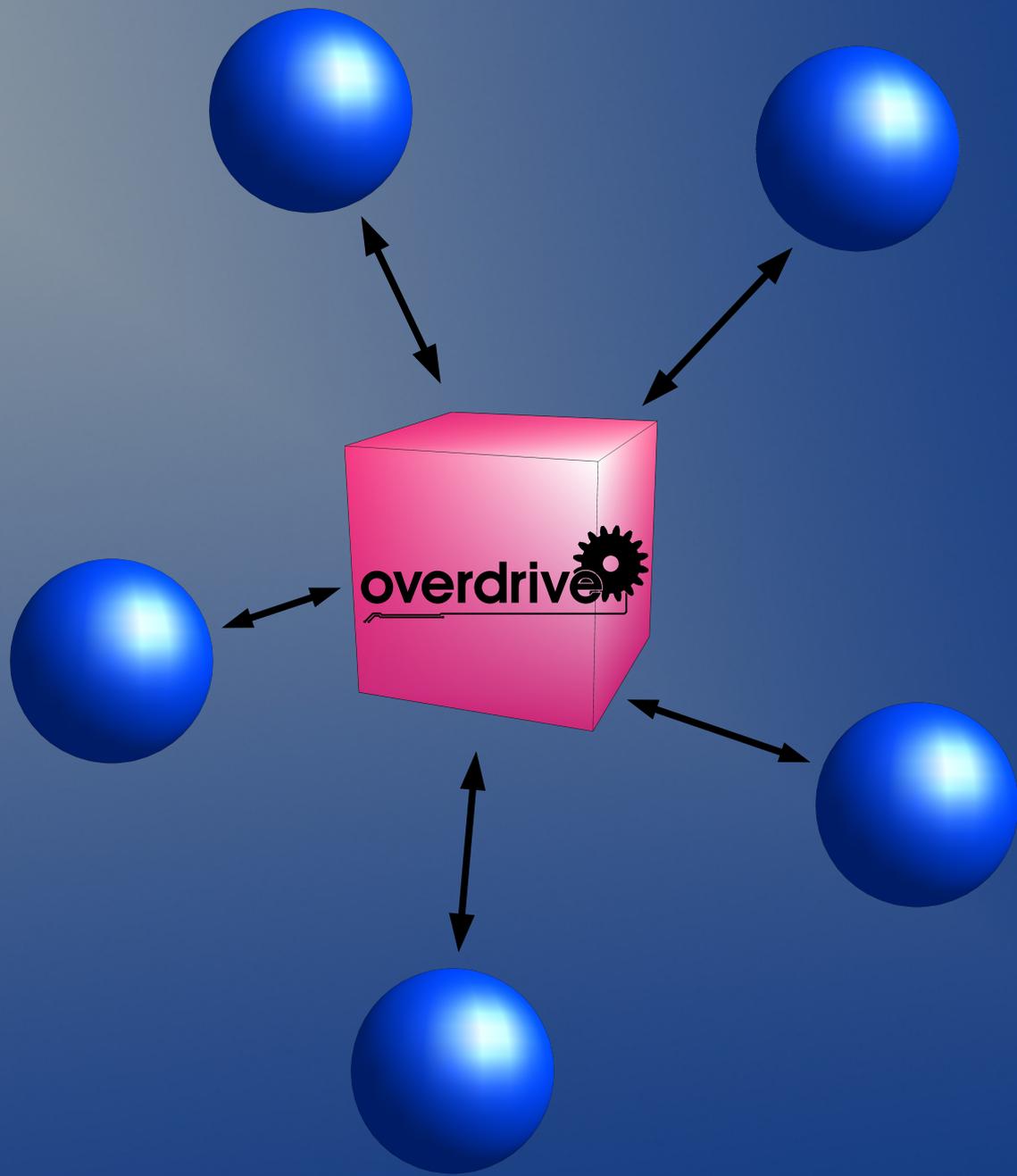


A point-to-point interface connects only two things, and...



the complexity of interfacing everything-to-everything is high.

What is simpler is a star-topology Network



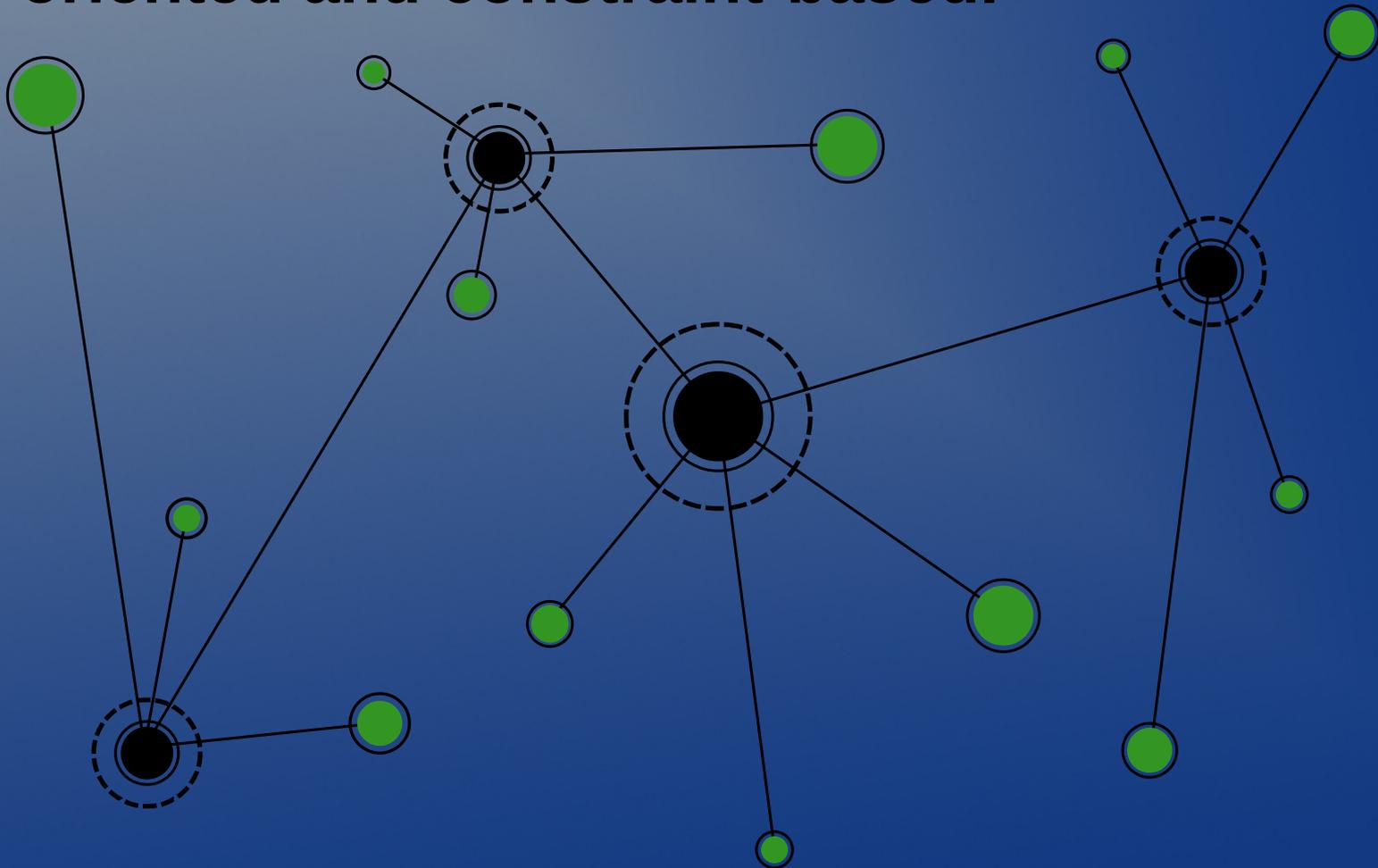
Where a central system handles all the interfaces.

Using Overdrive in this way, 7 different departments can interconnect to achieve creative goals:

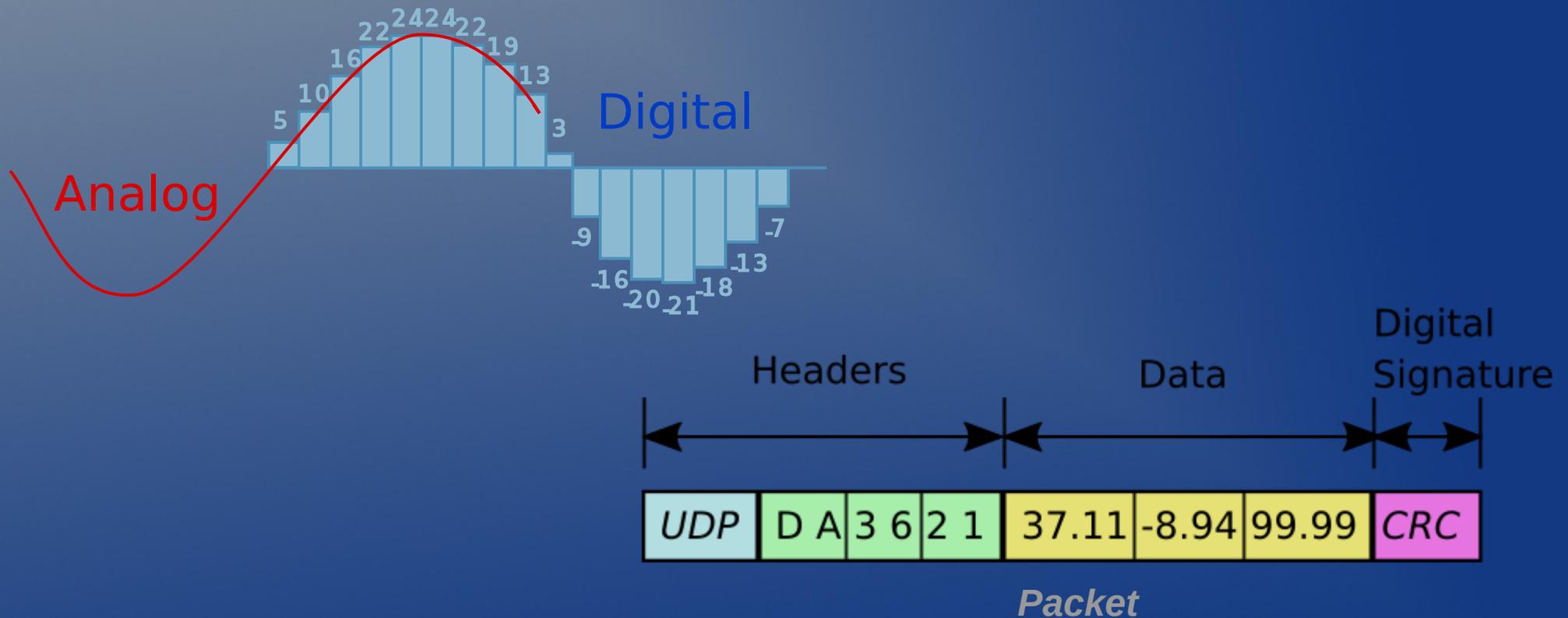
- **Camera**
 - **Special Effects**
 - **Animatronics**
 - **Lighting**
 - **Stunts**
 - **AR graphics**
 - **Visual Effects**

Overdrive was designed from the ground up to do such networking. This was a novel idea in the late 1990s, yet has become common in recent years.

To allow custom motion relationships between departments the software was designed to be both object-oriented and constraint-based.



Designed to be maximally digital, Overdrive was also a pioneer in phasing out analog and “open-loop” interfaces, in favor of packetized digital motion streams, with reliable data and extensible protocols.



Overdrive became a tool of choice for creative projects because it is constraint-based and object-oriented by design, making it highly configurable and adaptive to the design of new products and complex applications.



Motion Capture System



6 DOF

Overdrive Control Computer



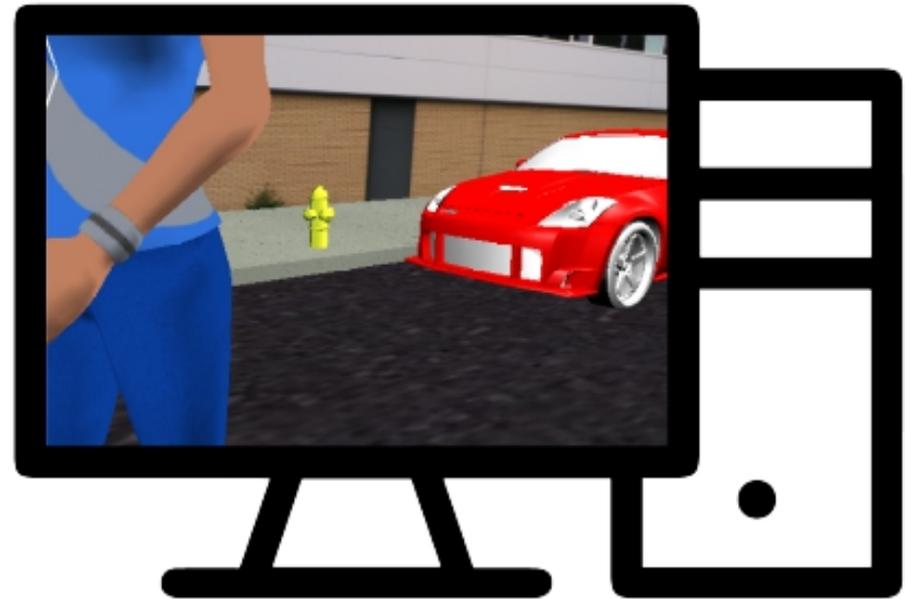
Button/Joystick Inputs



Virtual Camera

Ethernet

3D Display Computer



Virtual Camera Application

Motion Base Application



Motion Base



Video Wall



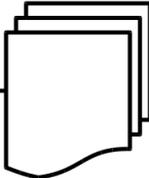
Overdrive

Gen-lock

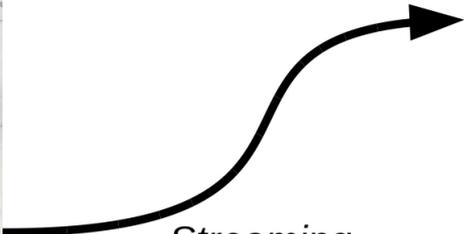
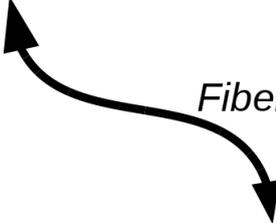
Fiber

Streaming Ethernet

Video Wall Computer



Maya Moves



Augmented Reality Encoding Application



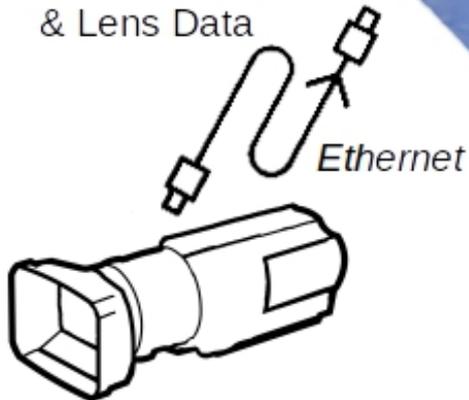
Camera Crane

Encoder positions
CANbus

Encoded Heads-up Display



Reads
Camera Head
& Lens Data



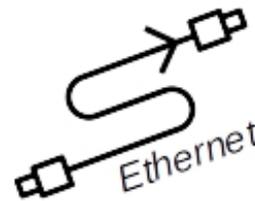
Ethernet

Gen-lock



Overdrive ONE

Solves position of the camera,
Based on encoder data



Ethernet



ArtNet



AR composite scene



Lighting console, moves lights

Animatronic Application



Joystick
Input



CANbus
digital



Overdrive Control Computer

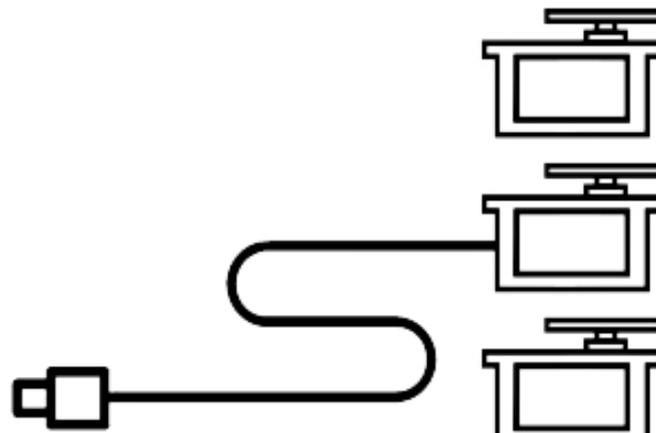


wireless

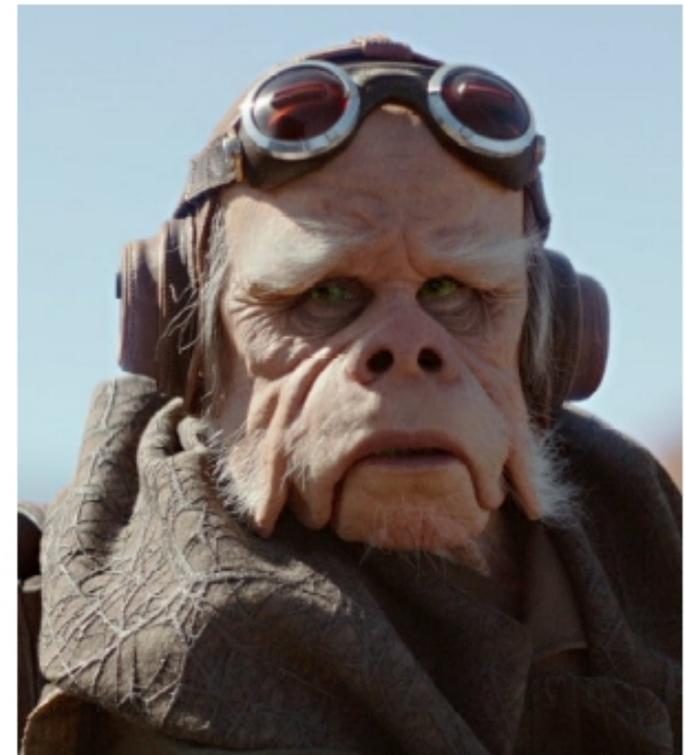
wireless



Overdrive Embedded Controller



RC servos



Animatronic Puppet



Joystick Input



CANbus digital



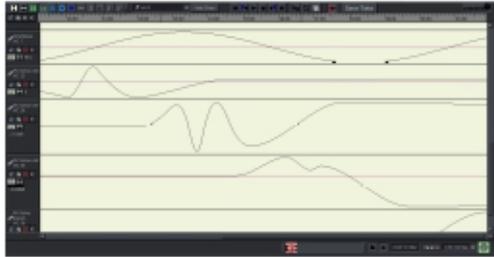
Overdrive Control Computer



Fiber

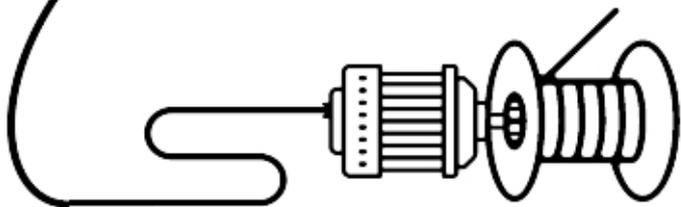


Overdrive Embedded Computer

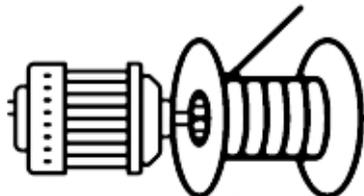


Pre-recorded move

Stunt and Camera Applications



CANbus digital



Motorized winches



Flying camera

Flying performer



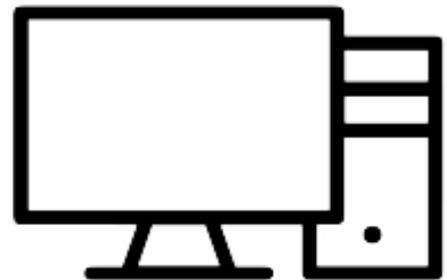
Motorized Camera Dolly Application



Joystick Input



CANbus digital



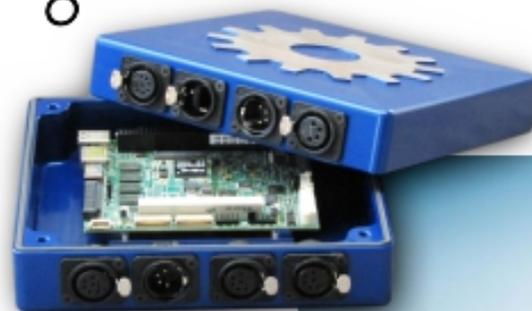
Base station Computer



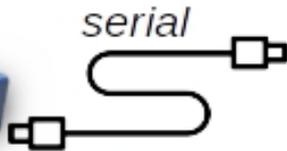
wireless



wireless

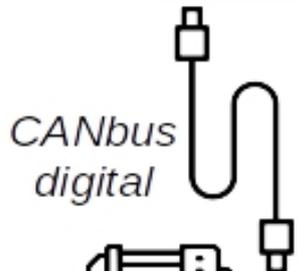


Overdrive on-board computer

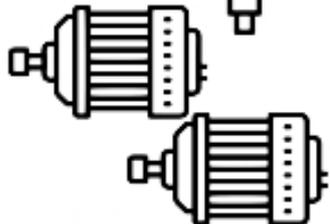


serial

camera control unit



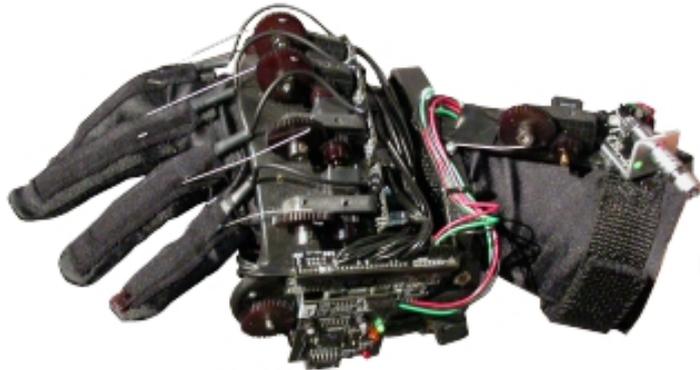
CANbus digital



Motors on dolly



CGI Puppeteering Application



Data glove



Overdrive Digital Input Device



wireless

3D Scene Computer



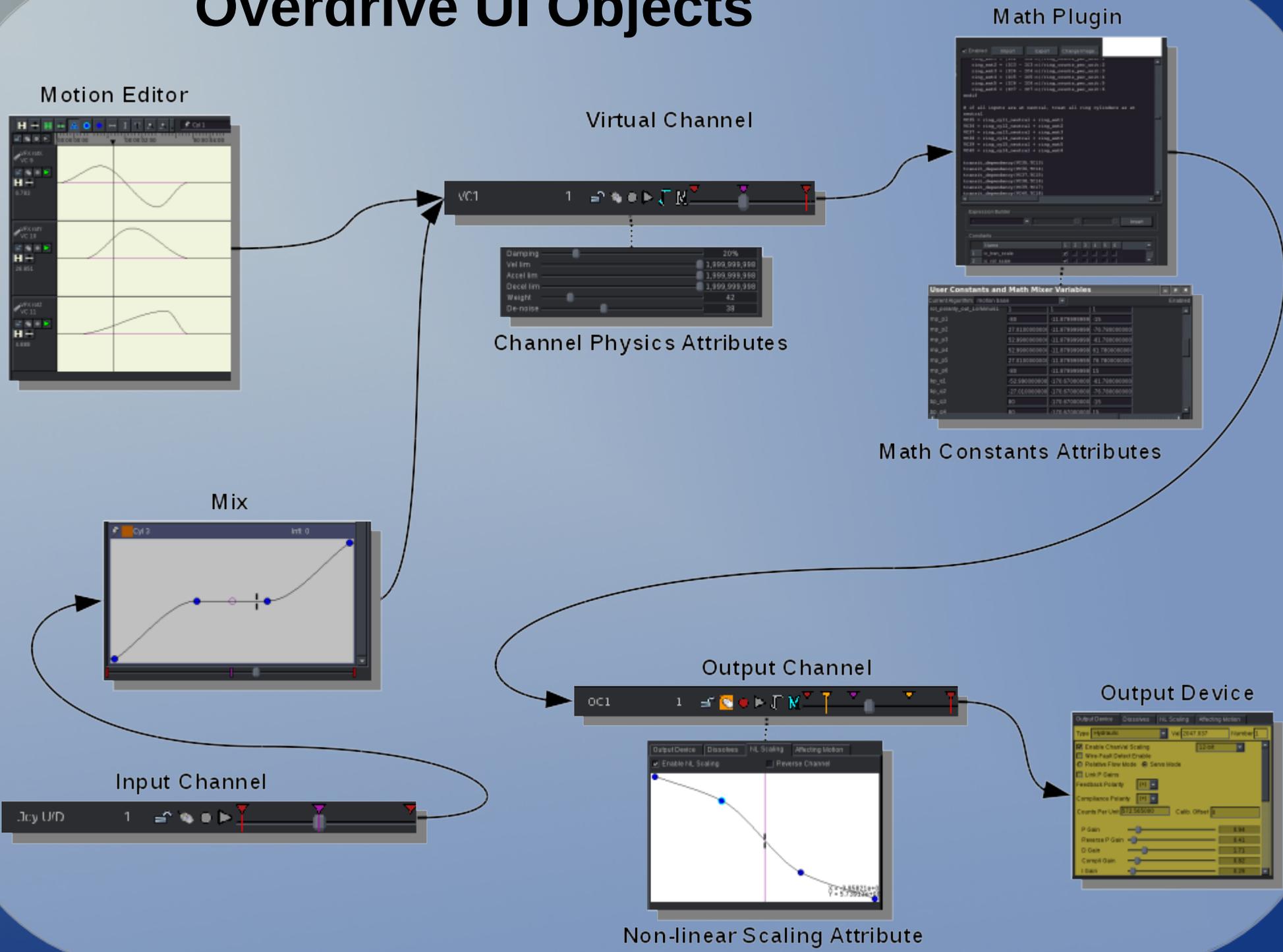
Overdrive Control Computer



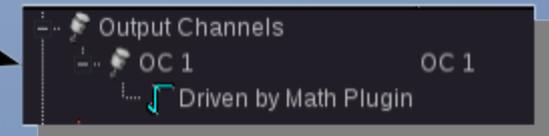
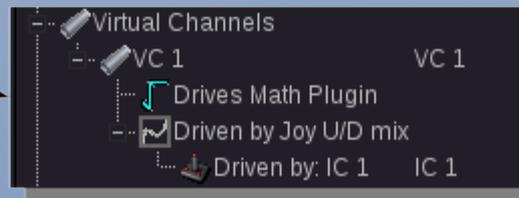
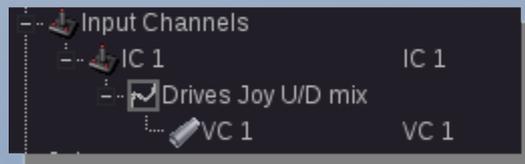
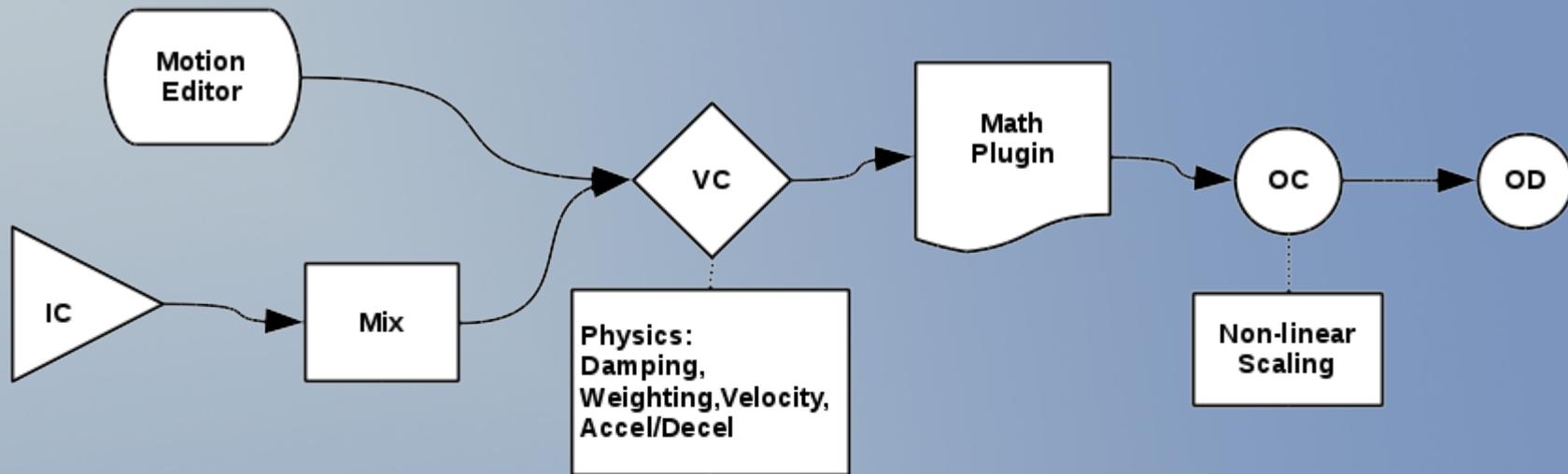
Ethernet

Overdrive has an intuitive user interface which increases efficiency when on stage or on location.

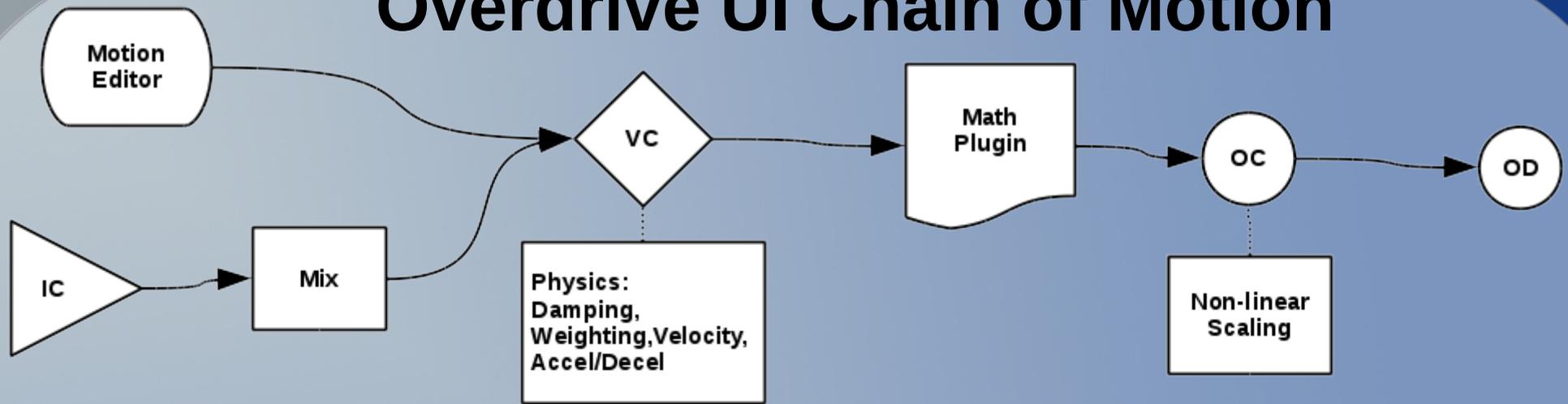
Overdrive UI Objects



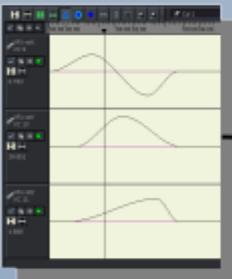
Overdrive UI Hierarchy



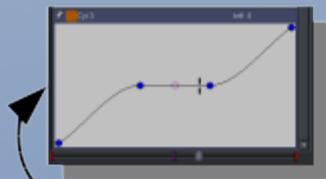
Overdrive UI Chain of Motion



Motion Editor



Mix



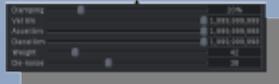
Input Channel



Virtual Channel



Channel Physics Attributes



Math Plugin



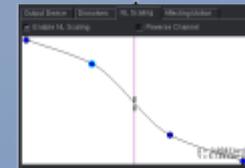
Math Constants Attributes



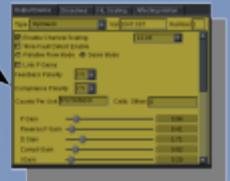
Output Channel



Non-linear Scaling Attribute



Output Device



The Motion Editor

Overdrive 3.5.1.5 [Profile: Shuttle.profile Show: Sequence 1>Show Audio: orgules_attack.wav]

Profile Show Edit Util Help

Prop Mix Out Chan In Chan Virtual Chan Binary Chan Telem Chan Attrb Chan Custom Groups Motion Editor

DIOD_Word_1 Add Chan Save Take

16.00 17.00 18.00 19.00 20.00 21.00 22.00

Elbow U/D IC 12
17342.619
-13443.267
3976.465
11977

Mobase Rx VC 1
61

Shoulder L/R OC 51
23

3D Y VC 2
83

chopper wake VC 56

Sound Track

Enable Lock

maintain current position

All ships in quadran

roger awaiting instructions

Look out! Incoming!

0:00:21:031 PB Rate 1.00 (24 fps)

In summary, Overdrive has been a valuable inter-departmental technology, and a modernizing influence, in television production for decades.

