IEEE Consumer Electronics Society

2018 Consumer Electronics Show

Image Capture AR/VR

Bill Orner

Santa Clara Valley Section
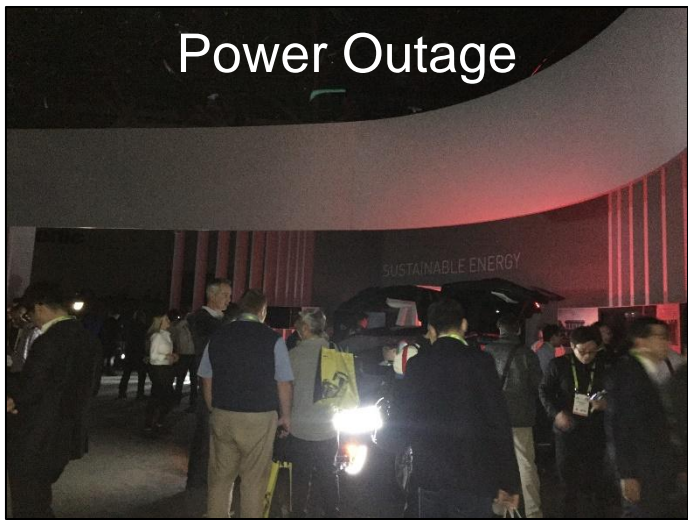
Jan 2018

IEEE
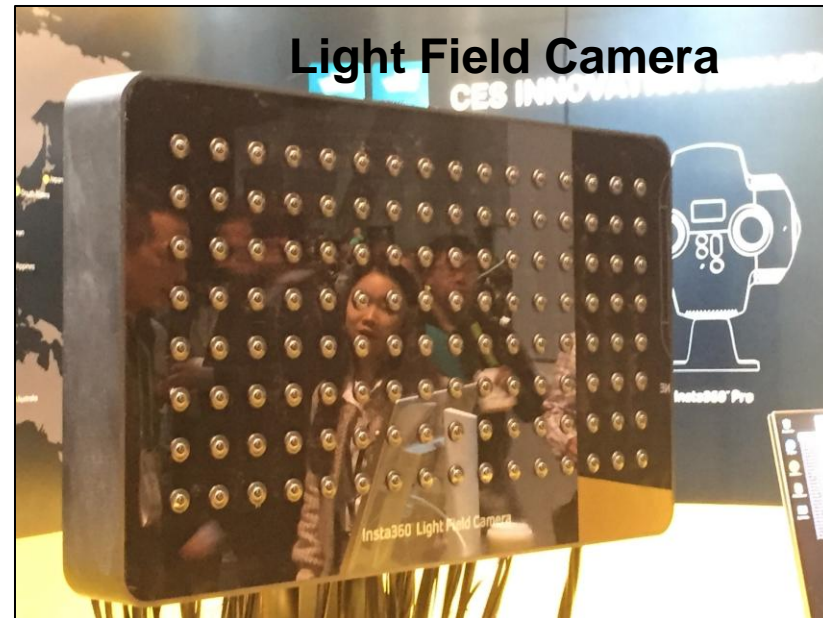
Advancing Technology
for Humanity

Housekeeping

- Comments made are the views of **me** (Bill Orner) and do not express the opinions of IEEE.
- Only covering Image Capture, AR/VR devices.
- Only covered emerging products, did not cover mature product areas, etc.
- This presentation is not an endorsement of any product.
- These are only the highlights.
- I have a lot of slides and will talk fast. Slides will be available online soon.

Welcome to CES!

Power Outage

Fine Dining!

Something for Everyone!

My speaker's smarter than yours!

Insta360

- Cell phone add-on camera
  - Dual sensor
  - 4K @ 30fps
  - iPhone only
- Light field camera prototype
  - 128 sensors
  - 6DOF, 180° FOV
- Pro360
  - 8K video, offline stitching
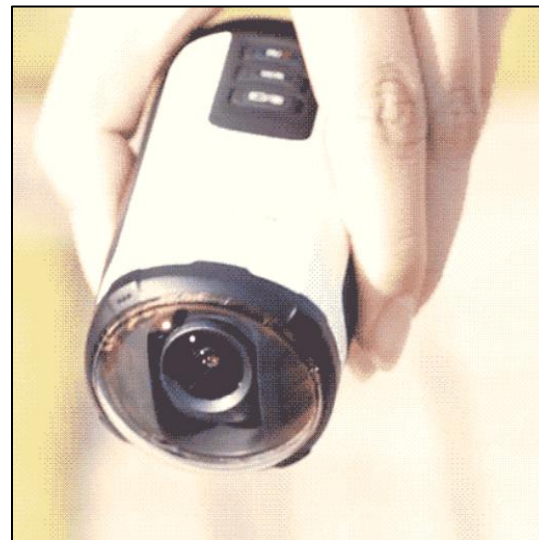 - 8 4/3 image sensors
  - No other info available

Light Field Camera

Light Field Wires

EKEN

- Clone camera company
- Pano V6
  - 2.7K @ 25fps
  - No other special features other than crazy low prices!

Redfox

- O2 Pocket Camera
  - 4K @ 30fps
  - 3-axis internal gimbal mechanism.
  - The smallest video camera on the market with integrated gimbal!

DJI

- Leader in Drones
- Purchased interest in Hasselblad
- OSMO+
  - Camera & Gimbal with phone UI
  - 4K @ 30fps
  - 1080 @ 100fps
  - Optical and digital zoom

Yi

- VR180
    - Dual sensor 3D capture
    - Up to 5.7K @ 30fps
    - Collaboration with Google, capture device for Cardboard

detu

- F4 Plus
    - 4 sensor 360° VR camera
    - 8K @ 30fps
    - Requires offline stitching
    - Special software for live streaming.
    - Supports Facebook Livestream format.
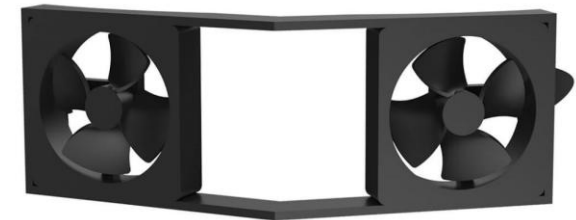   - $2,500, least expensive product in this class of device.

ABS

- AB9000
    - Ruggedized camera with integrated 3 axis gimbal
    - 4K @ 30fps
    - Crossover sports and industrial video camera

Pimax

- Kickstart project
- 8K VR Headset
  - Dual 3840 x 2160 @ 90Hz
  - 200 DOF
  - DisplayPort 1.4 & USB3
  - No eye tracking
  - Requires 3rd party sensors
  - Fan accessory??

Zeiss

- VR One
    - Head mount for your smartphone.
    - Essentially a precision version of Google cardboard with 3DOF.
    - Zeiss was founded in 1846, made telescopes and microscopes.
    - Legendary manufacturer of precision lenses.

Lumens

- Micro LED displays
  - 1280 x 720 pixels
  - 100,000 nits! Bright
  - 2.4 x 1.8 cm
  - LED-on-Module
  - Rapid evolving display technology.

Raontech

- Smart Glasses display
  - 2K x 1K LCOS @ 400Hz!
  - Consumes 250mW
  - Former ADI & Samsung management.

TT Robotix

- One of many companies in the drone business that have shifted to industrial applications.
- Reveal One
    - Thermal imaging camera
    - Radar for heart beat detection up to 30m away.
    - 72 inch rotor diameter
    - 35Kg flight weight
    - 25 minute flight time

Elan

- Elan Selfie
  - 1080 @ 30fps
  - Claims to be able to object track.
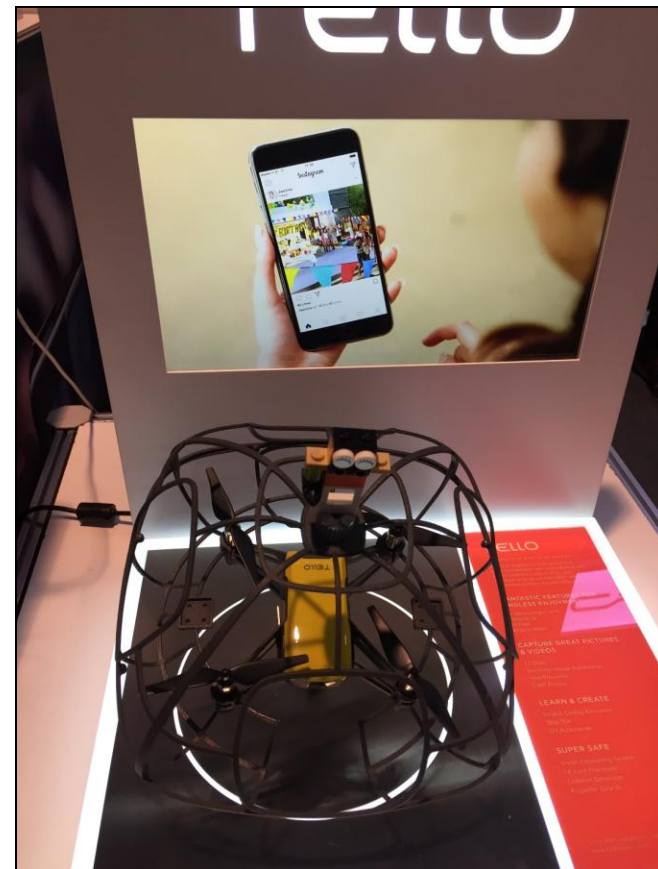 - Streams live video
  - REALLY small.

Sinochip

- Another company in the drone business that shifted to industrial applications.
- DF-T5
  - Crop duster drone
  - 20L fluid capacity
  - GPS spray tracking
  - 15 minute flight time with full payload.

Tello

- $99 drone!
  - Partnership with DJI
  - Movidius (Intel) processor
  - 720 @ 30fps
  - Object recognition
  - Video streaming
  - Open SDK
  - 13 minute flight time
  - 80 gram flight weight

GDU

- O2 Plus
  - Qualcomm Snapdragon 801
  - 4K @ 25fps
  - 3 axis gimbal
  - Obstacle avoidance
  - Indoor vision positioning (SLAM?)
  - "Follow me" flight control
  - Live streaming limited to 720 @ 30fps
  - Wireless distance of 4 miles!

Amaryllo

- Soteria
  - Cloud based face recognition system.
  - Monetize customer data??

NextVPU

- Glasses for visually impaired people
  - Object recognition
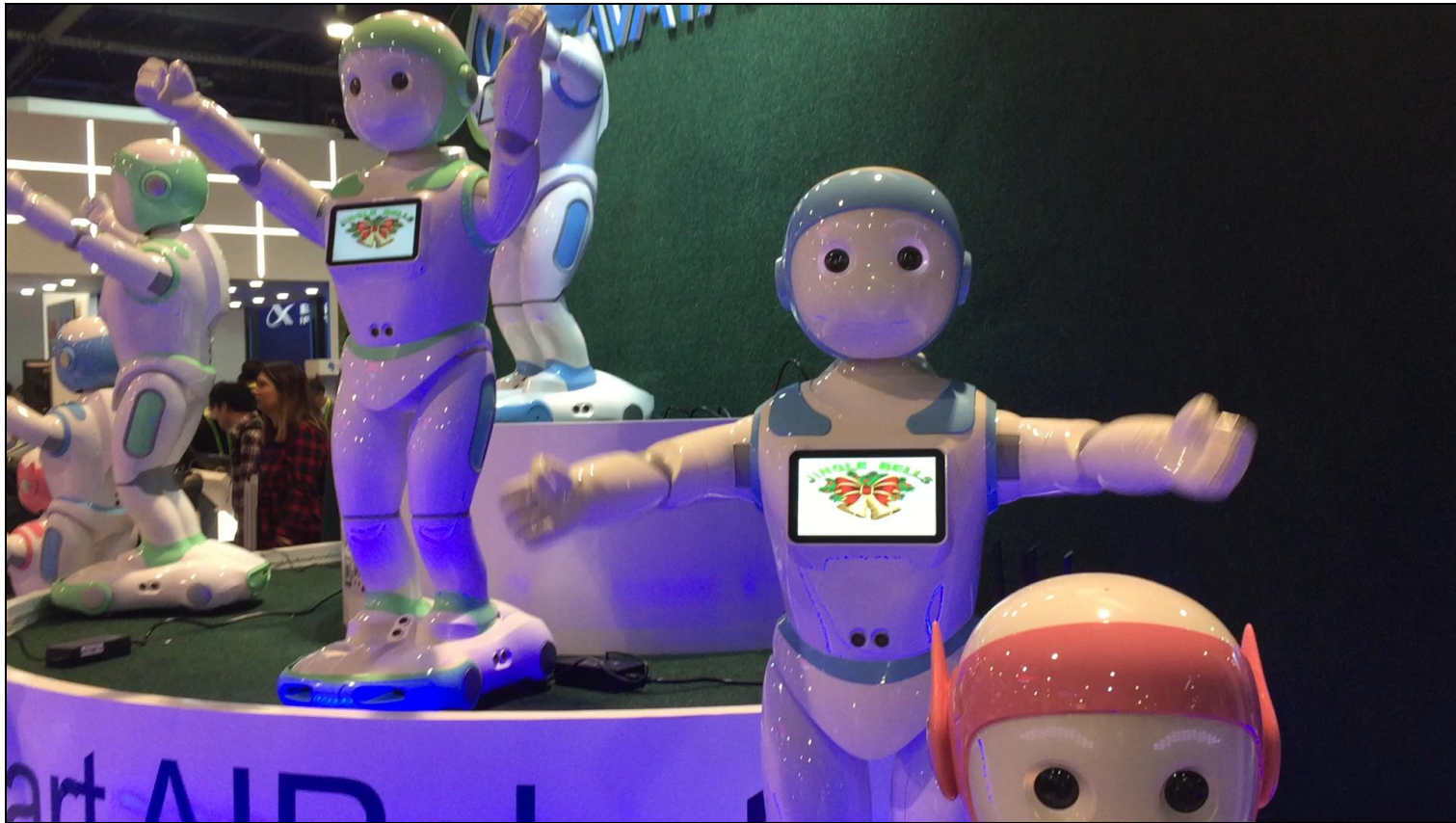 - Obstacle detection
  - Text to speech

Robby the Robot

- Robby 2
  - Delivery robot
  - Seen in downtown Mountain View
  - Company based in Palo Alto?
  - Probably not ideal for certain urban areas.

Robot Worker Replacements

Relaxation Area

Creepy Kid Toys

Closing Comments

- Personal camera is ubiquitous with the cell phone, no surprise.

- Everything must have Alexa or Google voice control to be new. You mean your toaster is a mute?

- Eco-system of key components for AR/VR is still not there, expect a few more years.

- VR and spherical cameras will be consumed by amateur and professional content creators.

- Standards for spherical video CODEC's and players stabilizing. See SMPTE, AOMedia, MPEG-LA, IEEE and others for more details.

Thank you to our venue host!

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