Screen-less display -> Visual imaging

HEADS-UP DISPLAY

Stay on road while driving

Start-ups: 3
Companies: 17
University: 4
Inventor: 1

Pioneering area of technology
- Intermediate image generation
- EVS & SVS Image merge technique
Technology Innovation Alert: Heads-Up Display

Highlights of the week

Active players of the week: E-Lead

Most filed jurisdiction: China

Rank of Head-up display types in this week:

1. Windshield projection display
2. Combiner Display
3. Virtual / Augmented Reality Display
4. On-Board display
Technology Innovation Alert: Heads-Up Display

Highlights of the week

Large companies
• E-lead
• Yazaki
• Denso
• Maxell
• Thales
• Amazon
• Panasonic
• Asahi Glass
• Nippon Seiki
• Japan Display
• Calsonic Kansei
• Konica Minolta
• Mitsubishi Electric
• Visteon Global Technologies
• Peugeot Citroen Automobiles
• Foryou Multimedia Electronics
• Valeo Comfort and Driving Assistance

Players of this week

Start-ups
• SHINEX ELECTRONIC IND INC
• Suzhou car radish car electronic technology
• Shanghai Wei Lai Automobile Co., Ltd
Technology Innovation Alert: Heads-Up Display

Highlights of the week

Individual inventor

- Xie Yanliang

Players of this week

Universities / Research centers

- Automotive Research & Testing Center (ARTC)
- The National Center for Scientific Research
- Aix-Marseille University
- University of Paris-Sud
Highlights of the week

Patents protected under jurisdictions in this week

China
German
Japan
Taiwan
France
United states

WIPO
Amazon has filed a **non publication request** for patent which discloses a non-mechanical assistance for autonomous vehicles.
Highlights of the week

Problems overcame this week

- Installation error
- Dust accumulation
- Increase in heat
- Limited Driver’s degree of freedom
- Information disappeared due to environmental light
## Highlights of the week

### Technologies of heads up display in this week

- Gaze detection
- User interface
- Display control
- Vehicle control
- Image processing
- Image projection
- Laser projection
- Light projection
- Optical elements
- Data presentation
- Data transmission
- Display arrangement
- Optics arrangement
- User identification
- Image superimposing
- Display architecture
- Display construction
- Display light control
- Network communication
- Vehicle communication
- Interactive windshield
- Wireless communication
- User movement detection
- Device fastening element
- Display mode calibration
- Display cover arrangement
- Device fastening technique
- Display device arrangement
- Display optics arrangement
- Depth information detection
- Display device architecture
- Display optics architecture
- Display optics construction
- Beam orders trapping element
- Image focal length detection
- Binocular parallax correction
- Detachable device arrangement
- Intermediate image generation
- Environment condition detection
- Projection distance calibration
- Viewer depth direction detection
- Vehicle future position detection
- EVS & SVS Image merge technique
- Image display apparatus configuration
Technology Innovation Alert: Heads-Up Display

A head-up display with multiple sandwich imaging mirror displays virtual image in multiple areas to avoid drivers posture limitation.

Patent Gist

By Universities / Research centers

Technologies involved

- Display architecture
- Display optics arrangement
- Display control

Application Field

Information display apparatus

Patent Family # 0

April 27, 2018 to May 03, 2018
A mounting method for split head-up display type for quick installation with less angle error by measuring relative positional relationship between optical lens and display module through the device.
Technology Innovation Alert: Heads-Up Display

10
April 27, 2018 to May 03, 2018

CN107968940

By Company

ADAYO Foryou Multimedia Electronics Co., Ltd.

Patent Gist

An ethernet based Augmented Reality Heads Up Display (AR HUD) transmits high definition Augmented reality using large bandwidth and strong anti-interference with reduced & easy wiring

Application Field

Information display apparatus

Technologies involved

- Network communication
- Wireless communication
- Data transmission

Application
A dust cover type head-up display device with pivotally connected cover bodies and base to prevent dust from falling into the interior of the base while wiping the dust.

Technologies involved:
- Display device architecture
- Display cover arrangement

Application Field:
Display cover arrangement
A linkage-type dust cap head-up display device with first cover and second cover folding linkage for open and close cooperation in order to achieve dustproof and ensure smooth operation.
Technology Innovation Alert: Heads-Up Display

By Startup

Shanghai Wei Lai Automobile Co., Ltd

Patent Gist

A head-up display device has non-transparent display instead of transparent head-up display to project key information to avoid driving information being disappeared from driver's field of vision due environmental light beams.

Application Field

Information display apparatus

Technologies involved

- Display optics architecture
- Display construction

April 27, 2018 to May 03, 2018
An electronic dongle with gimbal structure for displaying warning information on the inclined front windshield

By Individual inventor
Xie Yanliang

Patent Gist
An electronic dongle with gimbal structure for displaying warning information on the inclined front windshield

Application Field
Display fixing construction

Technologies involved
- Display device architecture
- Detachable device arrangement
An user interface in vehicle is provided with virtual three-dimensional operating element that is projected in driver field of view with gesture detection to interface with the displayed information in HUD.

Technologies involved:
- User interface
- Image projection
- Gaze detection
- Data presentation

By Company: Visteon

Patent Gist:

Application Field:

Information display apparatus
A fastening device for a vehicle head-up display module

Device fixation technique

- Device fastening element
- Display device architecture
A display device includes polarization separation element that splits polarized light into first and second polarized light to display first and second image in first and second projection area of projection plane to suppress heat radiation.
A HUD device projects and overlaps display image with scenery in front of the vehicle to display the display image as virtual image and HUD device adjusts contrast of display image with respect to scenery in front of vehicle.
A method of graphical representation of first image (EVS) of outside landscape overlaid on second image (SVS) representing a synthetic image of same outside landscape and displaying the two images in on-board viewing system of aircraft.

Technologies involved:

- EVS & SVS Image merging technique
- Data transmission
- Data presentation

Application Field:

Aircraft Viewing system
A partially transparent head up display with two faces i.e., first and second main face to reflect with reflection coefficient and to transmit with transmission coefficient of first and second light radiation incident on it to partially reflect light radiation emitted by image projecting system.

- Display optics architecture
- Image projection
- Data presentation

Application Field: Information display apparatus
A display control apparatus for controlling display unit in automatic driving vehicle to visually presenting future motion of vehicle scheduled in traveling control plan to user by superimposing image on windshield.

Application Field

Information display apparatus

Technologies involved

- Display control
- Image superimposing
- Vehicle future position detection
A display control device for Head up display to modify the size, depth and binocular parallax value of the displaying image to provide stereoscopic view to the user.
A display device comprises obliquely arranged light-emitting part to horizontally form the virtual image of the display image in depth direction when viewed from the viewer.
A laminated glass with first glass plate, second glass plate and intermediate film disposed between first glass plate and second glass plate used for head-up display to avoid double imaging
A head-up display device with light-receiving unit is configured to have light-receiving sensor to receive the outside light for adjusting the illuminance of light source.

Technologies involved:
- Image projection
- Display device architecture

Application Field:
Information display apparatus
A head-up display device comprises a rotatable reflection unit to reduce the number of rotatable components in reflection unit.

Technologies involved:
- Image projection
- Device fastening element
- Display device architecture
A head-up display comprises first and second head-up displays that are arranged at an angle at which optical center line of each display is intersected to enlarge display range of virtual image without sacrificing accommodation of display system.
An image display device with virtual image display optical system displays virtual images at plurality of distances at one time with simple configuration.
A head-up display comprises diffraction means arranged in intermediate image plane to diffract beam into plurality of zero-order and higher-order diffraction beams to control interference within light beam.
Technology Innovation Alert: Heads-Up Display

A display device optical component comprising first and second optical element to induce deflection & focusing of photons for virtual image production and to selectively reflect & transmit photons having particular band of wavelengths used by source

 Technologies involved
- Light projection
- Display device architecture
- Image projection
- Optics arrangement

Application Field
Information display apparatus

By Company & universities
PSA GROUPE, CNRS, Aix Marseille universite, UNIVERSITE PARIS SUD

Patent Gist

Patent Family # 0

April 27, 2018 to May 03, 2018
A head up display includes first light path module to projects image in front of driver's eyes and second light path module to receive external image light source to project image at relatively long distance to reduce visual dazzling feeling of driver.
A head-up display allows observer to visually recognize virtual image in viewpoint region by forming intermediate image and enlarging the intermediate image from the image displayed on the display surface.

Technologies involved:
- Display device architecture
- Optics arrangement
- Intermediate image generation
- Image projection

Application Field:
Information display apparatus
An autonomous vehicles for assistance is provided by detecting unknown environmental condition and presenting inquiry on display embedded in windshield and touch sensors are embedded in windshield to detect response of user to the inquiry.
A head-up display allows driver to visually recognize virtual image irrespective of the distance to object, and reducing the sense of incongruity on depth of the virtual image.

Technologies involved:
- Image superimposing
- Projection distance calibration
- Data presentation
- Depth information detection

Commercial Application:
Information display apparatus

Legal status:
Kind of final decision (Deemed to be withdrawn)
Technology Innovation Alert: Heads-Up Display

**TWM458347**

**By Startup**
Shinex electronic

**Patent Gist**
A head-up display device is installed in vehicle for receiving navigation information and projecting the navigation information to the windshield

**Commercial Application**
Information display apparatus

**Legal status**
Annulment or lapse of a utility model due to non-payment of fees

**Technologies involved**
- Image projection
- Display light control
- Wireless communication
- Display device architecture

April 27, 2018 to May 03, 2018
Solutions for the problems in this week

- Information displayed in display disappeared due to environment light
  - Heads up display with non-transparent display

- Limited degree of freedom of driver posture
  - Multiple sandwich imaging mirrors for producing multiple viewing zones
If you wish to receive updates on any particular technology of your business interest, please let us know.

Interested in knowing more

Email Us

Remain updated by Following us on

Contact:
Manohar Jha
mano@dexpatent.com
+91 822 000 7279