ARG

Augmented Reality Glasses

AI RA definition

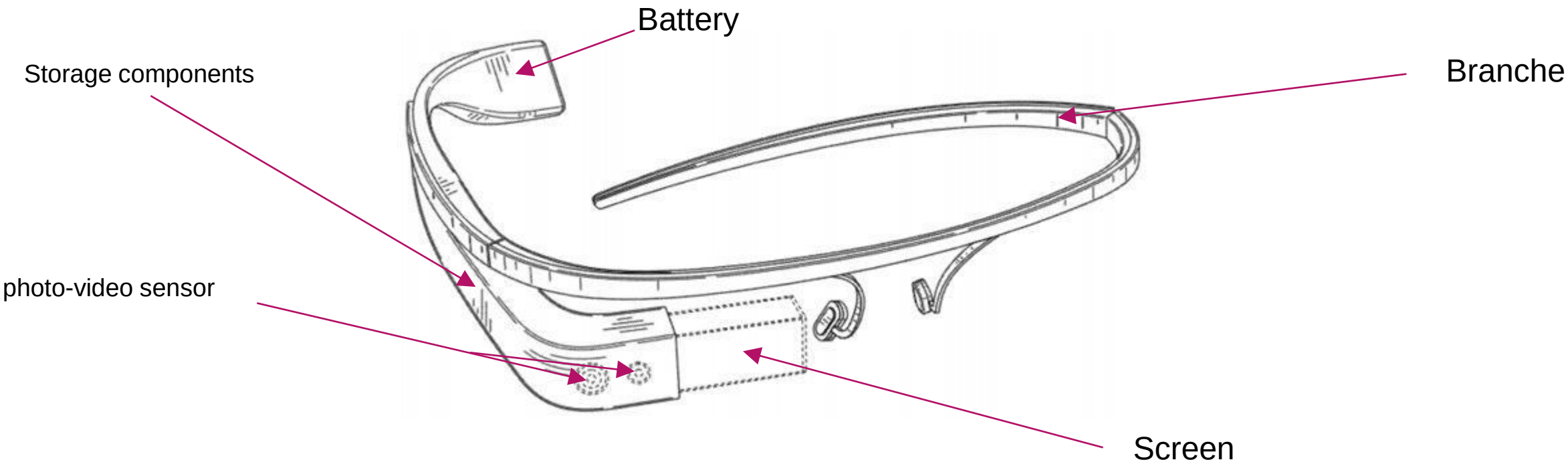
Between reality and the virtual world is the field of "augmented reality".
One of the video image as it is perceived by the brain which are superimposed graphic and text information.

1/ RA Glasses Constructors

Atheer Labs	Baidu	Canon	ChipSiP	Epson
Google	Kopin Corporation	**Laster Technologies**	Lenovo	Lumus
Meta	Olympus	Optinvent	ODG	Recon Instruments
Sony	Vuzix	Microsoft	Daqri	Apple

Google and Laster Technologies will be the two manufacturers we will study and compare.

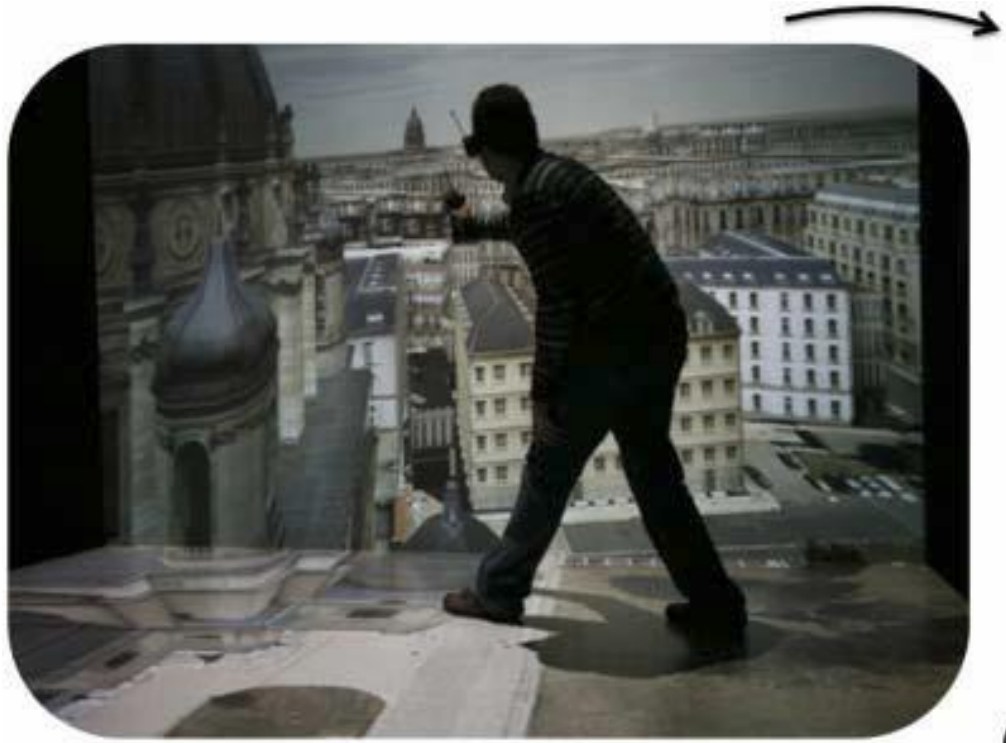
2/ Simple pattern of augmented reality glasses prototype

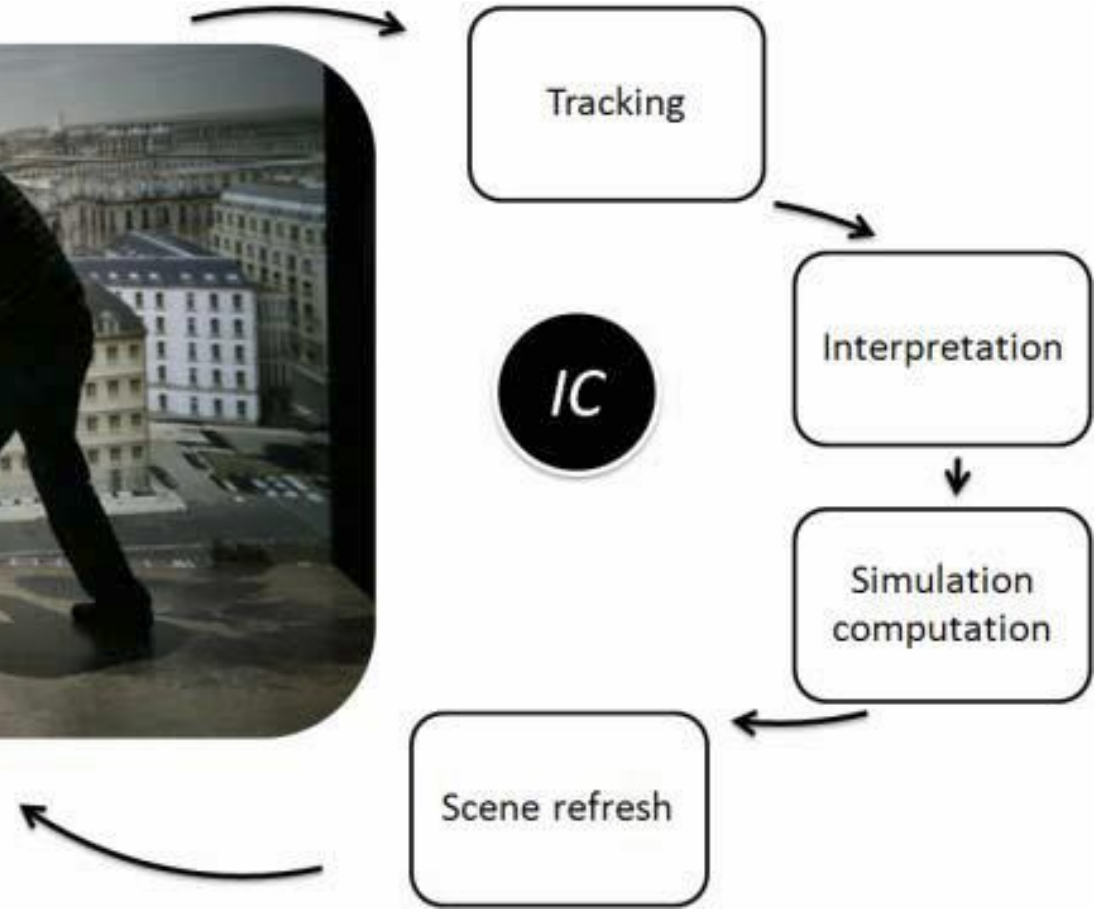


3/ RA Glasses Fonctionnalities :

RA fonctionnalities	Other fonctionnalities
Facing increased intuitive applications industrial applications medical applications military applications	Recording videos Shooting Send a message, email (for dictation) or SMS, and have them read by Google Glass, a call. Calendar, sports scores, schedules and plane trips, stock prices, weather ...

4/ Interaction Cycle





5/

Video capture - Perception Module

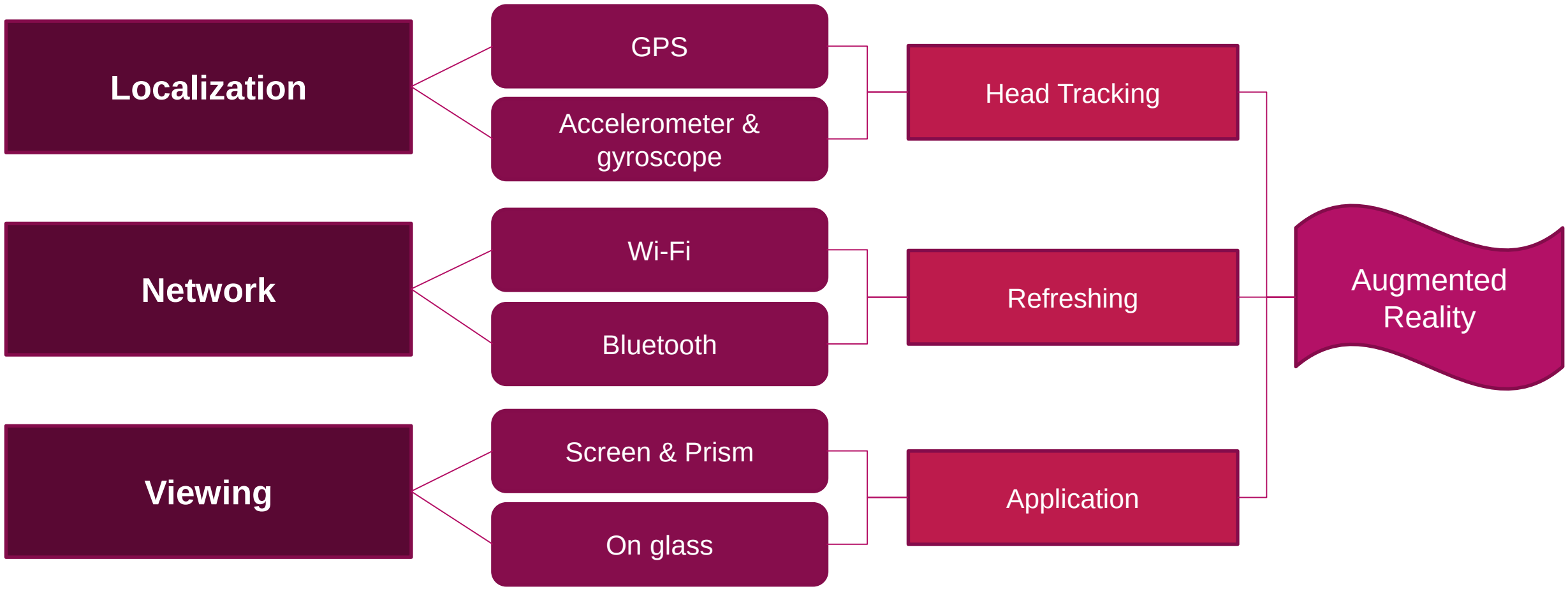
GPS and accelerometer - Localization Modules

Data recovery
the database

Internet connection (WiFi, Bluetooth) - Transmission Module

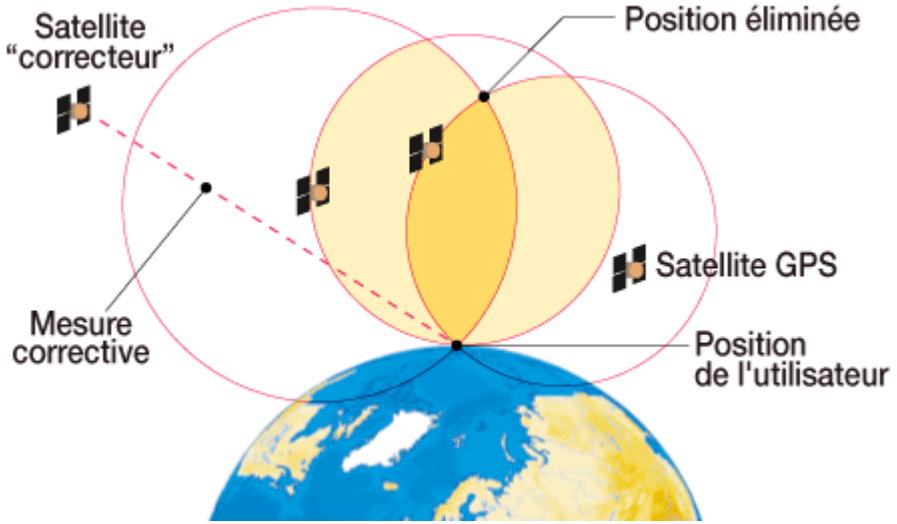
Viewing

B/ RA Modules


Localization
Network
Viewing
GPS
Accelerometer & gyroscope
Wi-Fi
Bluetooth
Screen & Prism
On glass
Head Tracking
Refreshing
Application
Augmented Reality

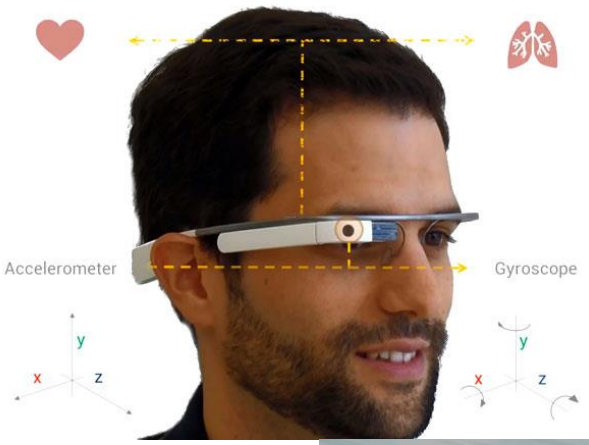
1/a) Positioning Module: GPS

- At every point on the globe, 4 satellites are always visible: this is the minimum number to ensure accurate GPS positioning.
- The satellite, equipped with an atomic clock of extreme precision, emit signals indicating the satellite's departure time.
- The glasses take delivery of RA in memory (via internet connection) the precise coordinates of 3 satellites that indicate its position: Longitude, latitude and altitude. A fourth satellite called "correction" will refine these three measures that correspond to WGS84 GPS coordinates.



Les 4 satellites GPS

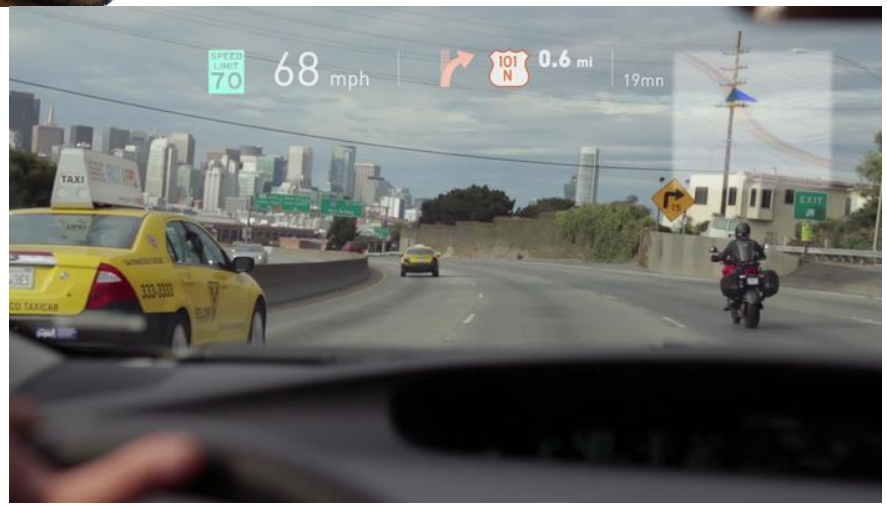
1/b) Positioning Module: The accelerometer and gyroscope



FOV (Field of View),

2 accessories come complement the GPS:

- The accelerometer present in the glasses used to calculate the flat slope of the field of view of the person doors.
- The gyroscope is used to calculate the rotation of glasses in space.



Using GPS Google Glass at the wheel of a car

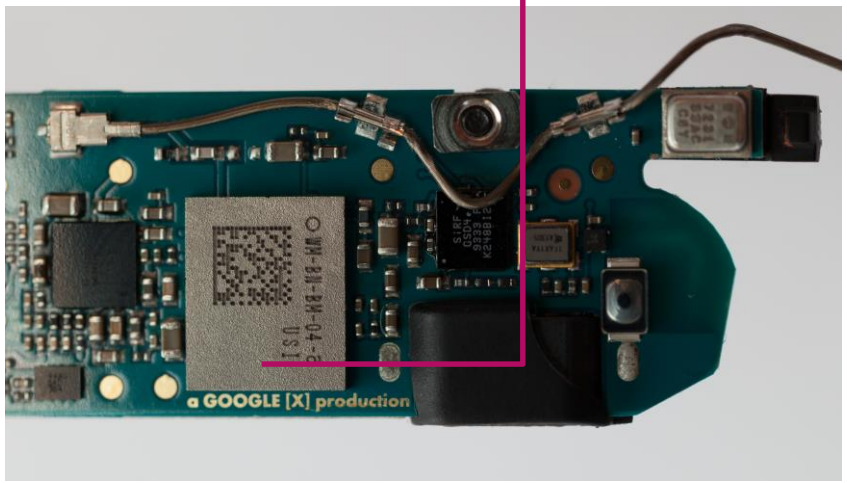
Data Fusion:

The assembly of the GPS, accelerometer and gyroscope used to calculate in real time what the user sees so to show the path he wishes to follow or view the desired data.

2/ Login Module: Chip Network

Existing models of augmented reality glasses do not have a 3G / 4G, the wireless chip can connect to a network via Wi-Fi.

For internet being out of range of a Wi-Fi network, the network chip will use Bluetooth to connect to a smartphone or other material using the 3G features, 4G, Edge or GPRS.



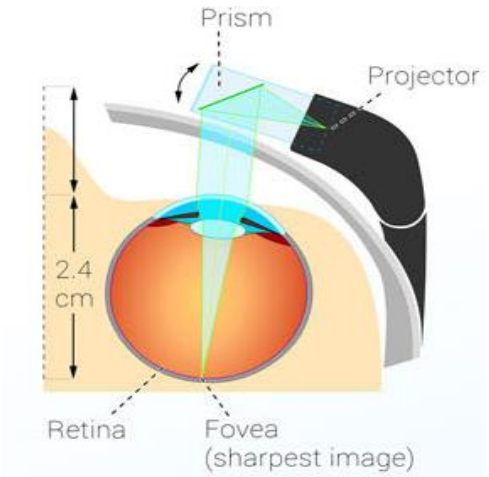
Motherboard with a pair of Google Glass

3/ Viewing module

On a screen (Google Glasses) :

- A prism returns via a two-way mirror, the interface in the user's field of vision. This "screen" projects an image which is equivalent to approximately a screen 25 " viewed at a distance of 2.44m.

The lens focuses the image directly on the retina



Directly on the glass (Laster technologies):

- Display any type of information (text, images, video, 3D, ...) on a single transparent glass.
- The specific curvature of a semi-reflecting optical surface reflects the image of a source of polychromatic light clogged in the wearer's field of vision. It is thus possible to obtain a field of view up extremely wide with a resolution higher than 800 x 600 pixels. This corresponds to a floating display screen of 34 " at a distance of 1 meter and about 88 " at a distance of 3 meters.
- The technology is known as augmented reality display technology offering the highest optical quality to date.

C/1) Industrial Application

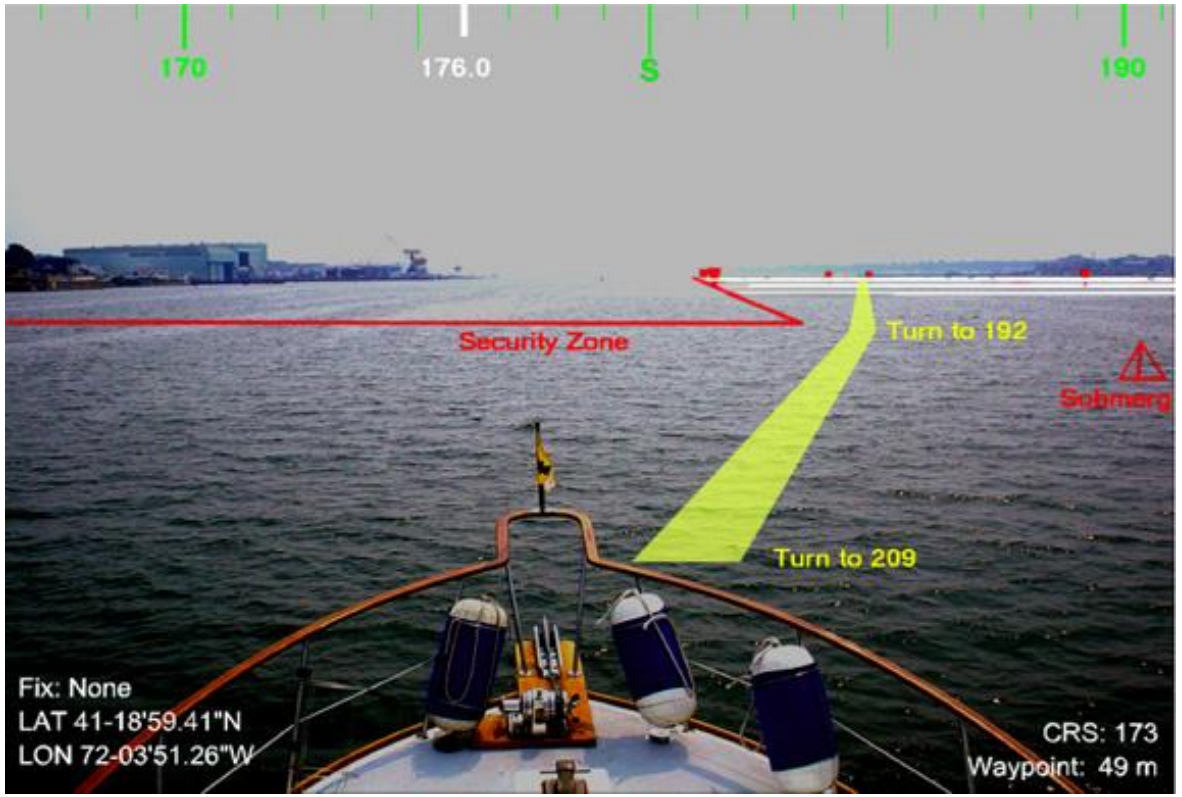
➢Laster Technologies :

Intended for professionals, it is composed of a monocular connected to a box, it allows technicians to view all of the information necessary for their most complex tasks.

C/2) Professional Application

- Using augmented reality glasses applied to helmsman job.

- The GPS features seen previously applied to augmented reality are used to their full potential in order to avoid professional potential accidents due to human error (Example: Costa Concordia disaster)



D/ RA Glasses Constraints

➢Legal constraint and privacy:
The augmented reality glasses are a problem with respect to privacy. Indeed, the ability to film or take pictures continuously and then distribute it directly on the Internet has caused many controversies because of opposition from Google Glass to the laws on privacy.
➢personal constraints:
In fact, if you use these glasses every day, Google can know where you go, who meet you, what you say, your favorite brands and products, those you hate, in short, your habits, with whom you share these of your life, etc.
Moreover, now new laws on information are in place in the last terrorist acts, making it a very current problem.
➢Other constraints:
The high price: $ 1,500.

Thank you for your attention

Question :

- Propose industrial idea about Using AR Application on AR GLASSES ?