

A Review Paper on 4 K Technologies

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Abstract- 4K resolution, also called 4K, is the biggest hitting trend in the last year. It is often called as Ultra HD. It is having horizontal resolution of 4,000 pixels and vertical resolution of 2000 pixels. The higher the resolution, the higher the required bandwidth and storage requirements of the content. 4K resolution exists in the field of digital cinema. Television market was down in 2014 and 2015 but due to 4K a boon of technology has again hit the market. It is expected that by 2025 half of the US households will be having resolution of 4K. YouTube and the television industry have adopted UHD-1 as their 4K standard. SONY is the only company who has launched 4K resolution TV in India.

I INTRODUCTION

4K resolution most commonly known by UHD (Ultra High Definition) variant for TV and PC displays. The resolution size of the pixels is 4 times more than the pixels of regular HD TV. Thus it is named as 4K. The result of the increased pixel is that the image clarity will go beyond the conventional 1080 pixel HD resolution. Due which we are capable to see more vibrant, varied and realistic color simply known as true life display. And it has much higher frame rates. This technology has been emerging in market since mid-2013. The 4K resolution has aspect ratio of 16:9. It has 3840 pixels (horizontal) * 2160 pixels (vertical) of resolution. It was originally introduced as QFHD “Quad Full HD”.

There are two main 4K resolution standards which are existing:

- The DCI 4K resolution standard, which has a resolution of 4096×2160 pixels and is widely used by the film and video production industry.
- UHD-1, or ultra-high-definition television (UHDTV), is the 4K standard used for television and computer monitors. UHD-1 is also called 2160p as it has twice the horizontal and vertical resolution of 1080p.

II COMPARISON OF 4K AND HD

The difference between 4K and UHD is of the pixel density and screen resolution.

Screen resolution

- Full HD : 1920* 1080
- 4K : 3840*2160

The distance of the viewer while watching 4K is reduced as comparison of the distance of viewer while watching Full HD.

The clarity of the images is increased in 4K as compared to Full HD.

The broadband speed used for 4K is 15-20 Mbps and for Full HD is 1800 Kbps.



III HISTORY

Today high resolution revolution represents the flowering of seeds sown in the early 20th century at the dawn of television. In the first half century of television, resolution was measured in lines per screen instead of pixels. The first television was having 819-240 lines per screen in 1930's - 1940.

The history was documented by Philip.J. In 1953 analog TV were launched in the US market with 525 lines. Followed by Europe in 1960 TV of 525 lines were launched.

Japan begin developing in the 5:3 TV.As computer revolution came in existence, the display of TV was transformed.

Earlier computers like as the TRS-80 and Commodore PET used cathode ray tubes to create monochrome displays. In

1977, the Apple II introduced colour CRT display by adapting the NTSC colour signal. The Apple II achieved a resolution of 280 pixels horizontally by 192 pixels vertically.

It continued, when IBM introduced VGA standard display of 640 * 480 in 1987. Desktop monitors have now standard resolution of 2560x1600, while mobile devices has range from 240x320 for the smallest devices to 1536x2048 for iPad Retina displays.



Fig: TV in 1930.

IV NEED OF 4K TECHNOLOGY

Nowadays people instead of looks or physical appearance of the devices prefer the technology of the device. If the technology and resolution of the device is good customer is ready to pay anything it costs. 4K has brought a revolution in the world of resolutions.

It's easy, or we can say easier to improve the important aspects of picture quality like contrast ratio, color accuracy, motion blur, compression artifacts, and so on. 4K is easier to manufacturer than an actual new technology.

This is just like megapixels of a camera. The picture taken from 16 mega pixel has more clarity than the mega pixel. Similarly in the TV, more the number of pixels of a screen better is the resolution and the clarity of the image and video. The distance of the viewer is also increased i.e., the distance between the person and the screen is increased hence not harmful for eyes.



Fig: Same image in different resolution.

V. APPLICATIONS

1. Medical imaging.
2. Simulation modeling such as oil & gas exploration.
3. Manufacturing inspection systems.
4. Aerial reconnaissance.
5. Megapixel surveillance.
6. Control room designing.

VI. CONCLUSION

4K is the technology of today's world from smallest to biggest device having a multimedia display. Even future depends upon the 4K resolution. It has application in every electronic device. Hence, it can help in inventing the devices in future having display resolution at its best. This technology can be an auxiliary to the HD display to obsolete the poor display of the screen. This technology will bring a radical change in the field of Science and technology.

VII. REFERENCES

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