DiamonDisplay

WORLD'S BRIGHTEST AUGMENTED-REALITY DISPLAY FOR VERY HIGH CONTRAST IN DAYLIGHT

WHAT IS DiamonDisplay?

It is a high-end solution for high-contrast augmented reality in bright daylight.

DiamonDisplay is an ultra-bright microscreen integrated in see-through casing that overlays information on a real-time view in full daylight with high contrast.

This micro-LED screen:

- provides brightness that is 100 to 1,000 times higher than current micro-screens
- enables very high definition
- is ideal for more compact, lighter products that consume less power

APPLICATIONS

High-brightness, enhanced-vision systems such as **head-up and head-mounted displays** can improve safety and performance. In fields such as aeronautics and automotive the displays allow pilots and drivers to receive key navigation data and information in their line of sight.

For consumers, **smart glasses with augmented reality** provide directions, safety updates, advertisements and other information across the viewing field. Small nomadic projectors can also take advantage of this technology.

WHAT'S NEW?

Currently available microdisplays for both head-mounted and compact head-up applications have fundamental technology limitations that prevent the design
of high-brightness, very low-weight, compact and low-energy-use products. Leti's technology breakthrough overcomes these limitations and is scalable to a standard microelectronic large-scale fabrication process.

For example, augmented-reality glasses require a very small and very high-brightness microdisplay to provide high-definition augmented-reality images outdoors. Leti's demonstrator, using only a few pixels out of the full display – 29 out of 70, 000! – shows the extremely high potential of this technology.

WHAT'S NEXT?

Monochrome emissive microdisplays will be available on the market within two years. Color displays will arrive in three years.

THE TECHNOLOGY

Leti's fundamental innovation is based on high-density micro-LED arrays. Leti researchers have developed gallium-nitride (GaN) LED technology for producing these high-brightness, emissive microdisplays.
With a brightness of more than 10^7 nits*, these GaN micro-LED arrays exceed by several orders of magnitude the ~10^3 nits available in current state-of-the-art OLED microdisplays.

Key innovations include micro-structuration of LED arrays (10 µm pitches or smaller) with high efficiency, and 3D heterogeneous integration (hybridization) of LED arrays on CMOS circuits.

DiamonDisplay demonstrates for the first time a pixel pitch as small as 10 µm obtained by hybridization of a GaN array on a silicon circuit. Moreover, the brightness levels in blue and green emissions (1 million nits and 10 million nits, respectively) are the highest ever published with emissive display prototypes.

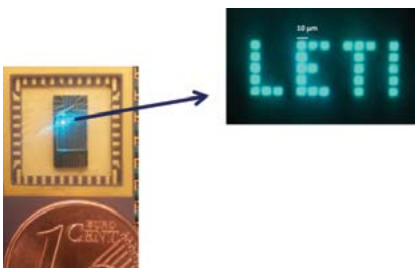
1 nit = 1 candela / m²

AWARD:

Leti's GaN micro screens won an "Innovation Award" at TechConnect World in June 2015 in Washington, D.C., as one of the top 20 most-promising innovations.

KEY FIGURES:

- OLED ~ 1,000 nits
- LED ~ 200,000 nits
- DiamonDisplay:
  ~1,000,000 nits (blue)
  & ~10,000,000 nits (green)



INTERESTED IN THIS TECHNOLOGY?

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