DEPARTMENT OF MECHANICAL ENGINEERING

MEA MAGAZINE

DEPARTMENT OF MECHANICAL ENGINEERING

SRI VENKATESWARA COLLEGE OF ENGINEERING , TIRUPATI

VOLUME-3 ISSUE-2 JAN-JUN 2019

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Nano Engines

Nanotechnology is the manipulation of matter on an atomic and molecular scale. It is the technology based upon the scaling down the existing technologies to next level of precision and miniaturization.

Nanotechnology in Mechanical Engineering field is the Internal combustion engine on a Nano scale, which is chosen in thermal engineering area of interest .

Revolution In Engines

External combustion engine is the heat engine in which fuel combustion takes place external to cylinder. Due to this it is bulky and consumes a lot of place.

Second revolutions of heat engines are ICE in which fuel combustion takes internally and consumes less place and became compact, cost effective. Of late third revolution is NANO Internal Combustion Engine.

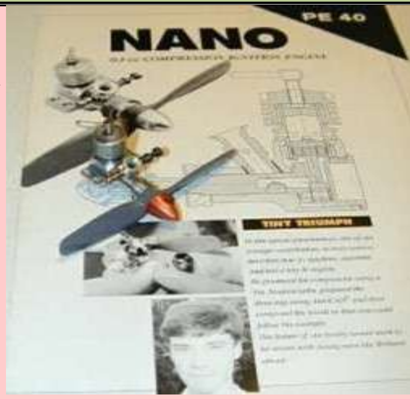
Idea of Size of Nano

From back plate to drive washer is less than 1 inch.There are no exotic materials required.It has high precision ,cost effective, high speed (up to 40000rpm).

The Nano is a 0.1cccompression ignition engine - most frequently, if somewhat inaccurately, referred to as a "diesel".

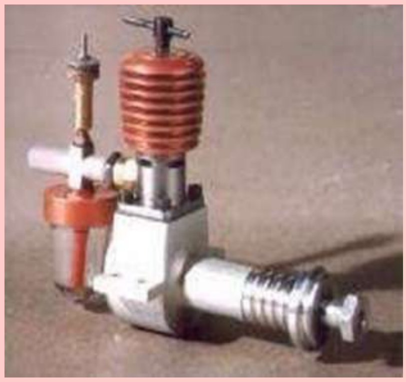
It was designed by Richard Gordon and the plans were included as a supplement with the British Magazine *Model Engineer* in the early 1990's. Like all model IC projects, there are a few special jigs and tools required to construct the Nano. The construction is extremely conventional - only the scale is unusual. The constructional cost is just USA$10 only in indian rupees it is approximately RS. 500 .

When it is fired, it run briefly, oscillating back and forth about TDC like over compressed diesels with small mass fly wheels are wont to do Running. Also, the fuel for mini diesels needs a lot of ether - as high as 50% by volume. With high ether fuel and a spring starter, The little Nano ic engine has various applications ranging from race cars to space crafts. It can be controlled in aero planes/ satellites/space ships etc., The timing of inlet and exhaust valves. According to NASA reports they are experimenting about theuse of Nano engine in Nano & Pico satellites.



Created by roboticist Joe Jones – inventor of the Roomba – Franklin Robotics' Tertill is a robot designed to live in your garden and take care of the weeding, come rain or shine.

Autonomous, solar-powered and equipped with four-wheel drive, Tertill is designed to live in a flower or vegetable garden from spring until winter roaming around rain or shine looking for small weeds and whacking them using a spinning string trimmer.



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VIRTUAL REALITY

The definition of virtual reality comes, naturally, from the definitions for both ‘virtual’ and ‘reality’. The definition of ‘virtual’ is near and reality is what we experience as human beings. So the term ‘virtual reality’ basically means ‘near-reality’. This could, of course, mean anything but it usually refers to a specific type of reality emulation.

Virtual Reality transposes us to a different world all together through the use of Head-Mounted Displays (HMD’s) such as the HTC Vive and Oculus Rift. Putting a VR Headset would leave you blind to your surroundings but will expand your senses to the experience within. You might, therefore, find yourself on top of Mars looking for water or in our case a pharmaceutical manufacturing plant operating complex and dangerous machinery such as the isolator.

Naming discrepancies aside, the concept remains the same - using computer technology to create a simulated, three-dimensional world that a user can manipulate and explore while feeling as if he were in that world. Scientists, theorists and engineers have designed dozens of devices and applications to achieve this goal. Opinions differ on what exactly constitutes a true VR experience, but in general it should include. Three-dimensional images that appear to be life-sized from the perspective of the user

The ability to track a user's motions, particularly his head and eye movements, and correspondingly adjust the images on the user's display to reflect the change in perspective In this article, we'll look at the defining characteristics of VR, some of the technology used in VR systems, a few of its applications, some concerns about virtual reality and a brief history of the discipline. In the next section, we'll look at how experts define virtual environments, starting with immersion.

Believable: You really need to feel like you're in your virtual world (on Mars, or wherever) and to keep believing that, or the *illusion* of virtual reality will disappear.

Interactive: As you move around, the VR world needs to move with you. You can watch a 3D movie and be transported up to the Moon or down to the seabed—but it's not interactive in any sense.

Computer-generated: Why is that important? Because only powerful machines, with realistic 3D computer graphics, are fast enough to make believable, interactive, alternative worlds that change in real-time as we move around them.

Explorable: A VR world needs to be big and detailed enough for you to explore. However realistic a painting is, it shows only one scene, from one perspective. A book can describe a vast and complex "virtual world," but you can only really explore it in a linear way, exactly as the author describes it.

Immersive: To be both believable and interactive, VR needs to engage both your body and your mind. Paintings by war artists can give us glimpses of conflict, but they can never fully convey the sight, sound, smell, taste, and feel of battle. You can play a flight simulator game on your home PC and be lost in a very realistic, interactive experience for hours (the landscape will constantly change as your plane flies through it), but it's not like using a real flight simulator (where you sit in a hydraulically operated mockup of a real cockpit and feel actual forces as it tips and tilts), and even less like flying a plane.

Immersive rooms

An alternative to putting on an HMD is to sit or stand inside a room onto whose walls changing images are projected from outside. As you move in the room, the images change accordingly. Flight simulators use this technique, often with images of landscapes, cities, and airport approaches projected onto large screens positioned just outside a mockup of a cockpit.

Applications:

VR has always suffered from the perception that it's little more than a glorified arcade game—literally a dreamy escape from reality. In that sense, virtual reality can be an unhelpful misnomer; alternative reality, artificial reality, or computer simulation might be better terms.

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3D– Scanning Technology

3D Laser Scanning is a non-contact, non-destructive technology that digitally captures the shape of physical objects using a line of laser light. 3D laser scanners create "point clouds" of data from the surface of an object. In other words, 3D laser scanning is a way to capture a physical object's exact size and shape into the computer world as a digital 3-dimensional representation.

3D laser scanners measure fine details and capture free-form shapes to quickly generate highly accurate point clouds. 3D laser scanning is ideally suited to the measurement and inspection of contoured surfaces and complex geometries which require massive amounts of data for their accurate description and where doing this is impractical with the use of traditional measurement methods or a touch probe.

3D-Scanning Process

Data Acquisition via 3D Laser Scanning 3D Laser Scanning Process An object that is to be laser scanned is placed on the bed of the digitizer. Specialized software drives the laser probe above the surface of the object. The laser probe projects a line of laser light onto the surface while 2 sensor cameras continuously record the changing distance and shape of the laser line in three dimensions (XYZ) as it sweeps along the object.

Resulting Data

The shape of the object appears as millions of points called a "point cloud" on the computer monitor as the laser moves around capturing the entire surface shape of the object. The process is very fast, gathering up to 750,000 points per second and very precise to (±.0005).

Modeling Choice Depends on Application

After the huge point cloud data files are created, they are registered and merged into one three-dimensional representation of the object and post-processed with various software packages suitable for a specific application.

Point Cloud Data for Inspection

If the data is to be used for inspection, the scanned object can be compared to the designer's CAD nominal data. The result of this comparison process is delivered in the form of a "color map deviation report," in PDF format, which pictorially describes the differences between the scan data and the CAD data.

CAD Model for Reverse Engineering

Laser scanning is the fastest, most accurate, and automated way to acquire 3D digital data for reverse engineering. Again, using specialized software, the point cloud data is used to create a 3D CAD model of the part's geometry. The CAD model enables the precise reproduction of the scanned object, or the object can be modified in the CAD model to correct imperfections. Like other DIY 3D scanners, the Atlas comes with its own tailored program.

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IVMECH