

Chapter 3 Performance Task 1

Geometry

Jet engine performance has been phrased as 'the end product that a jet engine company sells' and, as such, criteria include thrust, (specific) fuel consumption, time between overhauls, power-to-weight ratio. Some major factors affecting efficiency include the engine's overall pressure ratio, its bypass ratio and the turbine... cc2ed36002 In computational geometry, numerous algorithms are proposed for computing the convex hull of a finite set of points, with various computational complexities. cc2ed36002

Convex hull algorithms "A Minimalist's Implementation of the 3-d Divide-and-Conquer Convex Algorithms that construct convex hulls of various objects have a broad range of applications in mathematics and computer science.

Shamos, Computational Geometry, Chapter "Convex Hulls: Basic Algorithms"; Chan, Timothy cc2ed36002

DirectX Originally, the names of these APIs all began with "Direct", such as Direct3D, DirectDraw, DirectMusic, DirectPlay, DirectSound, and so forth. The name DirectX was coined as a shorthand term for all of these APIs (the X standing in for the particular API names) and soon became the name of the collection. a collection of application programming interfaces (APIs) for handling tasks related to multimedia, especially game programming and video, on Microsoft Microsoft DirectX is a collection of application programming interfaces (APIs) for handling tasks related to multimedia, especially game programming and video, on Microsoft platforms. The X initial has been carried forward in the naming of APIs designed for the Xbox such as XInput and the Cross-platform Audio Creation Tool (XACT. When Microsoft later set out to develop a gaming console, the X was used as the basis of the name Xbox to indicate that the console was based on DirectX technology cc2ed36002

The ACM is an umbrella organization for academic and scholarly interests in

computer science (informatics). Its motto is "Advancing Computing as a Science & Profession". cc2ed36002 Single locations in Euclidean 4D space can be given as vectors or 4-tuples, i.e., as ordered lists of numbers such as (x, y, z, w) . For example, the volume of a rectangular box is found by measuring and multiplying its length, width, and height (often labeled x , y , and z). It is only when such locations are linked... cc2ed36002 Designed by W. E. W. Petter, the Gnat has its origins in the preceding private venture Folland Midge. The issuing of Operational Requirement OR.303 by the British Air Ministry served to motivate the type's development; the Gnat was later submitted to meet this requirement. Its design allowed for its construction and maintenance tasks to be carried out without specialised tools, making it suitable for use... cc2ed36002 For example, consider navigating a mobile robot inside a building to a distant waypoint. It should execute this task while avoiding walls and not falling down stairs. A motion planning algorithm would take a description of these tasks as input, and produce the speed and turning commands sent to the robot's wheels. Motion planning algorithms might address robots with a larger number of joints (e.g., industrial manipulators), more complex tasks (e.g. manipulation of objects), different... cc2ed36002

Squares are special cases of rectangles, which have four equal angles, and of rhombuses, which have four equal sides. In geometry, a square is a regular quadrilateral. It has four straight sides of equal length and four equal angles. The area of a square is the side length multiplied by itself, and so in algebra, multiplying a number by itself is called squaring. As with all rectangles, a square's angles are right angles (90 degrees, or $\pi/2$ radians), making adjacent sides perpendicular. Squares are special cases of rectangles. In geometry, a square is a regular quadrilateral.

Equal squares can tile the plane edge-to-edge in the square tiling. Square tilings are ubiquitous in tiled floors and walls, graph paper, image pixels, and game boards. Square shapes are also often seen in building floor plans, origami paper, food servings, in graphic design and heraldry, and in instant photos...

Computing the convex hull means that a non-ambiguous and efficient representation of the required convex shape is constructed. The complexity of the corresponding algorithms is usually estimated in terms of n , the number of input points, and sometimes also in terms of h , the number of points

on the convex hull. cc2ed36002

Underwater acoustic positioning system North Carolina. Milne 1983, Chapter 2 Christ & Wernli 2007, p. Underwater acoustic positioning systems are commonly used in a wide variety of underwater work, including oil and gas exploration, ocean sciences, salvage operations, marine archaeology, law enforcement and military activities. 2. 96 Milne 1983, Chapter 3 Christ & Wernli 2007, section 4. 1 The Last Dive, National Geographic An underwater acoustic positioning system is a system for the tracking and navigation of underwater vehicles or divers by means of acoustic distance and/or direction measurements, and subsequent position triangulation cc2ed36002

Motion planning Springer-Verlag. Computational Geometry (2nd revised ed. Otfried Schwarzkopf (2000). 267–290 Motion planning, also path planning (also known as the navigation problem or the piano mover's problem) is a computational problem to find a sequence of valid configurations that moves the object from the source to destination.). Chapter 13: Robot Motion Planning: pp. ISBN 978-3-540-65620-3. The term is used in computational geometry, computer

animation, robotics and computer games cc2ed36002

Folland Gnat Under his direction, a variable geometry wing was applied to the basic Gnat 5 design The Folland Gnat is a British compact swept-wing subsonic fighter aircraft that was developed and produced by Folland Aircraft. Envisioned as an affordable light fighter in contrast to the rising cost and size of typical combat aircraft, it was procured as a trainer aircraft for the Royal Air Force (RAF) as well as by export customers, who used the Gnat in both combat and training capacities. wanted to use his knowledge of variable-geometry wings in future designs cc2ed36002

Four-dimensional space Three-dimensional space is the simplest possible abstraction of the observation that one needs only three numbers, called dimensions, to describe the sizes or locations of objects in the everyday world. This concept of ordinary space is called Euclidean space because it corresponds to Euclid's geometry, which was originally abstracted from the spatial experiences of everyday life. $\{\displaystyle$ Four-dimensional space (4D) is the mathematical extension of the concept of three-dimensional space (3D). four-

dimensional space with geometry defined by a non-degenerate pairing different from the dot product: $a \cdot b = a_1 b_1 + a_2 b_2 + a_3 b_3 - a_4 b_4$

Jet engine performance In the 1970s, economic pressure due to the rising cost of fuel resulted in increased emphasis on efficiency improvements for commercial airliners. Task 1: Feasibility A jet engine converts fuel into thrust. gov/citations/19790012903,"CF6 jet engine performance improvement program. One key metric of performance is the thermal efficiency; how much of the chemical energy (fuel) is turned into useful work (thrust propelling the aircraft at high speeds). Like a lot of heat engines, jet engines tend to not be particularly efficient (<50%); a lot of the fuel is "wasted". nasa. CR-165573, Figure 4-1 'Inlet angle of attack' https://ntrs.cc2ed36002

Association for Computing Machinery computational-geometry. org. It was founded in September 15, 1947 and is the world's largest scientific and educational computing society. Technica. Its headquarters are in New York City. Erickson, Jeff (June 5, 2014). The ACM is a non-profit professional membership group, reporting nearly 110,000 student and professional members as of 2022.

"About ACM affiliation". Retrieved August 7, 2023. Retrieved June 4, 2020. "A Brief History The Association for Computing Machinery (ACM) is a US-based international learned society for computing cc2ed36002

Required navigation performance DME/DME Required navigation performance (RNP) is a type of performance-based navigation (PBN) that allows an aircraft to fly a specific path between two 3D-defined points in space. although the specific characteristics change. GNSS performance is affected by the relative geometry of the satellites compared to the aircraft cc2ed36002

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