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Chapter 1 : Saab Automobile - Wikipedia

This paper focuses on the optimization of intentional mistuning patterns for the reduction of the sensitivity of the forced response of bladed disks to random mistuning. Intentional mistuning is achieved here by using two different blade types (denoted as A and B) around the disk.

As the war drew to a close and the market for fighter planes seemed to weaken, the company began looking for new markets in which to diversify. An automobile design project was started in with the internal name "X". The company made four prototypes named " Ursaab " or "original Saab", numbered through to , before designing the production model, the Saab 92 , in The Saab 92 went into production in December , [15] selling 20, cars through the mids. The 92 was thoroughly redesigned and re-engineered in , and was renamed the " Saab 93 ". A wagon variant, the Saab 95 , was added in The 96 was an important model for Saab: The unusual vehicle proved very popular, selling nearly , examples. Unlike American cars of the day, the 93, 95 and 96 all featured the 3-cylinder 2-cycle engine, which required adding oil to the gasoline tank, front-wheel drive, and freewheeling, which allowed the driver to downshift the on-the-column manual shifter without using the clutch. Front seat shoulder belts were also an early feature. The 99 was the first all-new Saab in 19 years and a clean break from the The 99 had many innovations and features that would come to define Saabs for decades: The design by Sixten Sason was no less revolutionary than the underlying technology, and elements like the Saab hockey stick profile graphic continue to influence Saab design. Saab-Scania The Saab 99 was launched in as an all-new design. The 99 range was expanded in with the addition of a combi coupe model, a body style which became synonymous with Saab. The millionth Saab was produced in Saab entered into an agreement with Fiat in to sell a rebadged Lancia Delta as the Saab and jointly develop a new platform. Even today, the "classic " retains a cult following. The new car shared a platform with the Opel Vectra. Due in large part to its success, Saab earned a profit in for the first time in seven years. However, the model never achieved the cult following of the "classic " and did not achieve the same reputation for quality. The received a facelift and renaming complementary to its new larger sibling: Filling that space was a wagon variant, introduced in Both models were a critical and commercial failure and were cancelled a few years after production began. Saab sport combi Owing to fading fortunes across its entire business, GM announced that the Saab brand was "under review" in December , a process which included the possibility of selling or shuttering the car maker. The following month, both parties announced that GM had consented to the deal. There were outstanding financial details, but a loan from the European Investment Bank was expected to cover them. The loan was approved in October, but on November 24, , Koenigsegg announced that it had "come to the painful and difficult conclusion that it could no longer carry out the acquisition. Earlier bidders Spyker and Merbanco revised their offers and were joined by a submission from Luxembourg-based Genii Capital , which boasted the support of F1 chief Bernie Ecclestone. Acknowledging that the chances for reaching a deal with any party were very slim, they pledged to evaluate each offer with due diligence. The deal included a loan from the European Investment Bank, guaranteed by the Swedish government. Spyker intended to change its name, in May, to include the Saab name. His request was denied by the EIB, citing concerns about his business practices. On May 3, a joint venture between Saab and Chinese carmaker Hawtai was announced. This deal quickly unraveled and on May 12 Hawtai walked away from Saab. On 19 December , with no alternatives left after GM continued to block any form of involvement with a Chinese partner, Saab officially filed for bankruptcy after a three-year fight for survival. Consequently, the deal finally collapsed and Saab was forced to file for bankruptcy. According to Spyker, the actions taken by GM were not legal. GM continued to refuse licensing of the technology in the Saab and X, so these models would not be produced. Scania believed the logo is of high value in China and feared that it would end up in the wrong hands through the Chinese interests behind NEVS. NEVS would be able to use the name Saab on future cars but not the griffin logo. Production of the would initially focus on a turbo-charged petrol variant, but an electric version - initially aimed at the

Chinese market - would start production in Production of the existing would commence shortly with a new electric motor, while Saab finished the preparations for the new Phoenix. The first pre-production model was mostly aesthetically identical to the previous Saab and mainly used to test new components and assembly line equipment. NEVS announced a facelift of the exterior to be shown on a finalised production model. On 29 November NEVS announced that full-scale production would commence on 2 December , having replaced the 20 percent of parts originally sourced from former Saab owner General Motors. As of this point, NEVS has not re-acquired the rights to the Saab name, and it is developing a new brand for the Chinese market. Production was suspended until late , when the new ownership launched a limited run of model year sedans.

Chapter 2 : Road - Wikipedia

Cognitive task analysis is defined as the extension of traditional task analysis techniques to yield information about the knowledge, thought processes and goal structures that underlie observable task performance.

Macadam Road construction requires the creation of an engineered continuous right-of-way or roadbed, overcoming geographic obstacles and having grades low enough to permit vehicle or foot travel , [34]: A variety of road building equipment is employed in road building. Storm drainage and environmental considerations are a major concern. Erosion and sediment controls are constructed to prevent detrimental effects. Drainage lines are laid with sealed joints in the road easement with runoff coefficients and characteristics adequate for the land zoning and storm water system. Drainage systems must be capable of carrying the ultimate design flow from the upstream catchment with approval for the outfall from the appropriate authority to a watercourse , creek , river or the sea for drainage discharge. Approval from local authorities may be required to draw water or for working crushing and screening of materials for construction needs. The topsoil and vegetation is removed from the borrow pit and stockpiled for subsequent rehabilitation of the extraction area. Side slopes in the excavation area not steeper than one vertical to two horizontal for safety reasons. Trees in the road construction area may be marked for retention. Compensation or replacement may be required if a protected tree is damaged. Much of the vegetation may be mulched and put aside for use during reinstatement. The topsoil is usually stripped and stockpiled nearby for rehabilitation of newly constructed embankments along the road. Stumps and roots are removed and holes filled as required before the earthwork begins. Final rehabilitation after road construction is completed will include seeding, planting, watering and other activities to reinstate the area to be consistent with the untouched surrounding areas. Blasting is not frequently used to excavate the roadbed as the intact rock structure forms an ideal road base. When a depression must be filled to come up to the road grade the native bed is compacted after the topsoil has been removed. The fill is made by the "compacted layer method" where a layer of fill is spread then compacted to specifications, under saturated conditions. The process is repeated until the desired grade is reached. The lower fill generally comprises sand or a sand-rich mixture with fine gravel, which acts as an inhibitor to the growth of plants or other vegetable matter. The compacted fill also serves as lower-stratum drainage. Select second fill sieved should be composed of gravel , decomposed rock or broken rock below a specified particle size and be free of large lumps of clay. Sand clay fill may also be used. The roadbed must be "proof rolled" after each layer of fill is compacted. If a roller passes over an area without creating visible deformation or spring the section is deemed to comply. These materials and methods are used in low-traffic private roadways as well as public roads and highways. The type of road surface is dependent on economic factors and expected usage. Safety improvements such as traffic signs , crash barriers , raised pavement markers and other forms of road surface marking are installed. When a single carriageway road is converted into dual carriageway by building a second separate carriageway alongside the first, it is usually referred to as duplication, [41] twinning or doubling. The original carriageway is changed from two-way to become one-way, while the new carriageway is one-way in the opposite direction. In the same way as converting railway lines from single track to double track , the new carriageway is not always constructed directly alongside the existing carriageway. Deterioration is primarily due to accumulated damage from vehicles, however environmental effects such as frost heaves , thermal cracking and oxidation often contribute. Potholes on roads are caused by rain damage and vehicle braking or related construction works. Manual road repair taking place in Howrah, India Line marking in rural India Pavements are designed for an expected service life or design life. In some parts of the United Kingdom the standard design life is 40 years for new bitumen and concrete pavement. Maintenance is considered in the whole life cost of the road with service at 10, 20 and 30 year milestones. When pavement lasts longer than its intended life, it may have been overbuilt, and the original costs may have been too high. When a pavement fails before its intended design life, the owner may

have excessive repair and rehabilitation costs. Some asphalt pavements are designed as perpetual pavements with an expected structural life in excess of 50 years. Pro-active agencies use pavement management techniques to continually monitor road conditions and schedule preventive maintenance treatments as needed to prolong the lifespan of their roads. These measurements include road curvature , cross slope , asperity , roughness , rutting and texture. Software algorithms use this data to recommend maintenance or new construction. Maintenance treatments for asphalt concrete generally include thin asphalt overlays, crack sealing, surface rejuvenating, fog sealingfo, micro milling or diamond grinding and surface treatments. Thin surfacing preserves, protects and improves the functional condition of the road while reducing the need for routing maintenance, leading to extended service life without increasing structural capacity. This can extend the life of the concrete pavement for 15 years. Slab stabilization[edit] Distress and serviceability loss on concrete roads can be caused by loss of support due to voids beneath the concrete pavement slabs. The voids usually occur near cracks or joints due to surface water infiltration. The most common causes of voids are pumping, consolidation, subgrade failure and bridge approach failure. Slab stabilization is a non-destructive method of solving this problem and is usually employed with other Concrete Pavement Restoration CPR methods including patching and diamond grinding. The technique restores support to concrete slabs by filing small voids that develop underneath the concrete slab at joints, cracks or the pavement edge. The process consists of pumping a cementitous grout or polyurethane mixture through holes drilled through the slab. The grout also displaces free water and helps keep water from saturating and weakening support under the joints and slab edge after stabilization is complete. The three steps for this method after finding the voids are locating and drilling holes, grout injection and post-testing the stabilized slabs. Slab stabilization does not correct depressions, increase the design structural capacity, stop erosion or eliminate faulting. It does, however, restore the slab support, therefore, decreasing deflections under the load. Stabilization should only be performed at joints and cracks where loss of support exists. Visual inspection is the simplest manner to find voids. Signs that repair is needed are transverse joint faulting, corner breaks and shoulder drop off and lines at or near joints and cracks. Deflection testing is another common procedure utilized to locate voids. It is recommended to do this testing at night as during cooler temperatures, joints open, aggregate interlock diminishes and load deflections are at their highest. Testing[edit] Ground penetrating radar pulses electromagnetic waves into the pavement and measures and graphically displays the reflected signal. This can reveal voids and other defects. It consists of drilling a 25 to 50 millimeter hole through the pavement into the sub-base with a dry-bit roto-hammer. Next, a two-part epoxy is poured into the hole â€” dyed for visual clarity. Once the epoxy hardens, technicians drill through the hole. If a void is present, the epoxy will stick to the core and provide physical evidence. Common stabilization materials include pozzolan -cement grout and polyurethane. The requirements for slab stabilization are strength and the ability to flow into or expand to fill small voids. Colloidal mixing equipment is necessary to use the pozzolan-cement grouts. The contractor must place the grout using a positive-displacement injection pump or a non-pulsing progressive cavity pump. A drill is also necessary but it must produce a clean hole with no surface spalling or breakouts. The injection devices must include a grout packer capable of sealing the hole. The injection device must also have a return hose or a fast-control reverse switch, in case workers detect slab movement on the uplift gauge. The uplift beam helps to monitor the slab deflection and has to have sensitive dial gauges. Successful resealing consists of old sealant removal, shaping and cleaning the reservoir, installing the backer rod and installing the sealant. Sawing, manual removal, plowing and cutting are methods used to remove the old sealant. Saws are used to shape the reservoir. When cleaning the reservoir, no dust, dirt or traces of old sealant should remain. Thus, it is recommended to water wash, sand-blast and then air blow to remove any sand, dirt or dust. The backer rod installation requires a double-wheeled, steel roller to insert the rod to the desired depth. After inserting the backer rod, the sealant is placed into the joint. There are various materials to choose for this method including hot pour bituminous liquid, silicone and preformed compression seals.

Chapter 3 : University of Michigan Control Courses

In: Simitses, G.J. (ed.) Analysis and Design Issues for Modern Aerospace Vehicles- , pp. American Society of Mechanical, New York () Google Scholar 5.

This approach is analogous to the kinetic theory of gases, in which the macroscopic properties of a gas are described by a large number of particles. PDF methods are unique in that they can be applied in the framework of a number of different turbulence models; the main differences occur in the form of the PDF transport equation. The PDF is commonly tracked by using Lagrangian particle methods; when combined with large eddy simulation, this leads to a Langevin equation for subfilter particle evolution. Vortex method[edit] The vortex method is a grid-free technique for the simulation of turbulent flows. It uses vortices as the computational elements, mimicking the physical structures in turbulence. Vortex methods were developed as a grid-free methodology that would not be limited by the fundamental smoothing effects associated with grid-based methods. To be practical, however, vortex methods require means for rapidly computing velocities from the vortex elements â€" in other words they require the solution to a particular form of the N-body problem in which the motion of N objects is tied to their mutual influences. A breakthrough came in the late s with the development of the fast multipole method FMM , an algorithm by V. Rokhlin Yale and L. This breakthrough paved the way to practical computation of the velocities from the vortex elements and is the basis of successful algorithms. They are especially well-suited to simulating filamentary motion, such as wisps of smoke, in real-time simulations such as video games, because of the fine detail achieved using minimal computation. Among the significant advantages of this modern technology; It is practically grid-free, thus eliminating numerous iterations associated with RANS and LES. All problems are treated identically. No modeling or calibration inputs are required. Time-series simulations, which are crucial for correct analysis of acoustics, are possible. The small scale and large scale are accurately simulated at the same time. Vorticity confinement method[edit] Main article: Vorticity confinement The vorticity confinement VC method is an Eulerian technique used in the simulation of turbulent wakes. It uses a solitary-wave like approach to produce a stable solution with no numerical spreading. VC can capture the small-scale features to within as few as 2 grid cells. Within these features, a nonlinear difference equation is solved as opposed to the finite difference equation. VC is similar to shock capturing methods , where conservation laws are satisfied, so that the essential integral quantities are accurately computed. Linear eddy model[edit] The Linear eddy model is a technique used to simulate the convective mixing that takes place in turbulent flow. It is primarily used in one-dimensional representations of turbulent flow, since it can be applied across a wide range of length scales and Reynolds numbers. This model is generally used as a building block for more complicated flow representations, as it provides high resolution predictions that hold across a large range of flow conditions. Simulation of bubble swarm using volume of fluid method The modeling of two-phase flow is still under development. Different methods have been proposed, including the Volume of fluid method , the Level set method and front tracking. This is crucial since the evaluation of the density, viscosity and surface tension is based on the values averaged over the interface. Implicit or semi-implicit methods are generally used to integrate the ordinary differential equations, producing a system of usually nonlinear algebraic equations. Applying a Newton or Picard iteration produces a system of linear equations which is nonsymmetric in the presence of advection and indefinite in the presence of incompressibility. Such systems, particularly in 3D, are frequently too large for direct solvers, so iterative methods are used, either stationary methods such as successive overrelaxation or Krylov subspace methods. Krylov methods such as GMRES , typically used with preconditioning , operate by minimizing the residual over successive subspaces generated by the preconditioned operator. Multigrid has the advantage of asymptotically optimal performance on many problems. Traditional[according to whom? By operating on multiple scales, multigrid reduces all components of the residual by similar factors, leading to a mesh-independent number of iterations. To analyze these

conditions, CAD models of the human vascular system are extracted employing modern imaging techniques. A 3D model is reconstructed from this data and the fluid flow can be computed. Blood properties like Non-Newtonian behavior and realistic boundary conditions e. Therefore, making it possible to analyze and optimize the flow in the cardiovascular system for different applications. These typically contain slower but more processors. For CFD algorithms that feature good parallellisation performance i.

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Chapter 4 : News - Motor Trend

A CFD analysis of the full UAV configuration described in Sections 1 Introduction, 2 Conceptual design, 3 Preliminary design was also performed. Furthermore, comparisons with analytical/semi-analytical methods and computational results were carried out.

In lieu of an abstract, here is a brief excerpt of the content: The 18th and 19th Centuries I. General and Collected Works 1 Abelshauser, Werner, ed. Geschichte und Gesellschaft, Sonderheft; Collection of essays reviewed by Ulrich Wengenroth in Technikgeschichte 63, no. Technology and European Overseas Enterprise: Diffusion, Adaptation, and Adoption. Aldershot, England, and Brookfield, Vt.: The European Impact on World History, â€”; 7. Anthology of previously published excerpts from books and articles. Reviewed by Daniel B. Headrick in Technology and Culture 39 April Introduction by William J. Complete text of report on experiments carried out since the s, with new index and discussion notes. Geary; and Kris L. Science for the Twenty-First Century: The Bush Report Revisited. The Endless Frontier, first published in Preserving Nature in the National Parks: From the founding of Yellowstone National Park in to the present. The Remarkable Story of Risk. History of the role of risk in decision-making and of risk management from the Middle Ages to the present. Introduction to a special theme issue of Technikgeschichte. Lesebuch zur Geschichte der Umwelt im You are not currently authenticated. View freely available titles:

Chapter 5 : Bureau of Transportation Statistics

bright light on acquisition problems in A&D. fighter jet and an Asian space launch vehicle, Deloitte's analysis of DoD data from

In , Pierre Beuzit became project manager of the X65 programme. In December , a final design developed under Patrick Le Quement was approved, with development for production commencing, so in Renault rented a ,square-foot building in Saint-Quentin-en-Yvelines, west of Paris. More than people from Renault and its suppliers went to work there. Forty teams were created, each responsible for a section of the car. In February , management moved market launch by over 1 month from 15 March to 11 April Development ended in , as pre-production units began to be constructed at Flins. Part of the radical concept of the new Clio were many components made of unusual materials to save in weight and repair costs. Originally the engine lineup was similar to before, with 1. In early , a sportive 16V version equipped with a new 1. The standard Clio RTE powered with a 1. Production over 3 years was approximately vehicles with sold in the UK. In , a few minor changes were made to the Clio range, which included revised specification levels, a new instrument cluster, and a passenger airbag fitted as standard for all models. The chassis was also significantly revised with a slightly longer wheelbase and revised suspension together with larger 18 inch alloy wheels. Production from to the end of was approximately vehicles of which were sold in the UK. This is a facelift that was released in In , Phase 3 followed starting on a 53 Plate, this was just some small changes to bring it up to date. The front bumper was changed giving it a wide lower grille and the foglights were bulged out at the side cars not equipped with foglights remained using the older ph2 bumper , the upper grille was changed and the headlights which previously had black background now had grey. The 15" alloy wheels were changed and were now a 15" version of the facelift model on Dynamique and Extreme models. Clear side repeaters were added, as was a colourcoded rear spoiler again on Dynamique spec cars. In the South American market, the facelifted Clio continued to use the dashboard of the model and was never updated, except for the Colombian model that included the same interior of the European version with little changes, and continued having the same exterior as the phase II model. Climate control equipped cars were given a vent in the back of the glove box so it could be climate controlled. Rear disks were fitted on 1. For the first time there were two options in chassis stiffness for the RS model. This version lasted a month January on sale, before both Clio and Platina being replaced by the Dacia Logan and Sandero. It kept the dashboard of the pre-facelift version, but with new gauges and optional color matching inserts. The sedan version of the Clio was facelifted in , with new exterior similar to the facelifted Clio, better equipment and safety levels. In the fall of , an improved Clio sedan has been offered, renamed in Eastern Europe as Renault Symbol. This model featured the interior of the facelifted Clio II with very minor parts commonality with Megane II , as well as new standard and optional equipment, such as automatic air conditioning and a CD player. The model earned moderate reception in the domestic market. The new model features chrome-trimmed front grille and rear fascia, while powered by similar engines as the Dacia Logan range. The problem was found to be caused by the catch not being cleaned and lubricated during servicing causing it to stick in the open position. Renault investigated the issue with the aid of the Vehicle and Operator Services Agency VOSA and a "task force" of Renault departments to test the design but found no problem with the bonnet catch and so would not issue a recall. Renault instead wrote to owners of the model and offered to "remedy for free any catches where there has been poor maintenance".

Chapter 6 : Bombardier | Home

Aerodynamics is the science that deals with the motion of air and other gaseous fluids, and with the forces acting on solid bodies when they move through gaseous fluids, or when gaseous fluids move against or around solid bodies. Therefore aerodynamics comes into play when air is flowing over.

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Chapter 7 : Project MUSE - Bibliography

We explore the structural optimization problems that we can solve at present and conclude that we can solve problems with the highest possible complexity in only two of the three components of model, analysis procedure or optimization.

Chapter 8 : Boeing: The Boeing Company

Product design is the process of deï¬•ning all the features and characteristics of just about anything you can think of, from Starbuck's cafe latte or Jimmy Dean's sausage to GM's Saturn or HP's DeskJet printer.

Chapter 9 : Computational fluid dynamics - Wikipedia

II (4 credits) Basic techniques for analysis and design of controllers applicable in any industry (e.g. automotive, aerospace, computer, communication, chemical, bioengineering, power, etc.) are discussed.