DOWNLOAD PDF THE MULTIMEDIA ATLAS OF VIDEOKERATOGRAPHY

Chapter 1 : UCB Computer Graphics : OPTICAL

This bar-code number lets you verify that you're getting exactly the right version or edition of a book. The digit and digit formats both work.

Map-dot-fingerprint dystrophy may not be symptomatic. But if it is, learn when different treatment strategies are necessary. Epithelial basement membrane corneal dystrophy EBMD , or map-dot fingerprint corneal dystrophy, is an inherited congenital disorder that affects the corneal epithelium and basement membrane. Characteristic clinical expression is typically exhibited after the forth decade of life. Secondary corneal effects include epithelial microcystic edema, recurrent corneal erosion RCE and visual axis involvement. Symptoms or visual disturbances range from negligible to pain and significant visual obscurations. Treatment varies depending on the severity of the condition and patient symptoms. Management strategies in advanced cases include observation, topical and oral medications such as oral NSAIDs or doxycycline , bandage contact lenses, epithelial debridement, anterior stromal puncture or therapeutic laser. Patient History An established patient, a year-old white female, presented for a routine examination in May with a chief complaint of blurred vision in her right eye that had become noticeable two weeks before her visit. She reported no double vision, loss of peripheral vision, change in pupil size, change in either lid position or pain; however, she did say that her vision loss appeared to be gradual. She had been a compliant long-time disposable soft contact lens wearer for nearly 20 years without incident, and her ocular history was unremarkable. Diagnostic Data Best corrected visual acuity through Keratometry was unremarkable and unchanged compared to prior visits at Humphrey Atlas topography with Pathfinder analysis revealed minimal corneal distortion in both eyes. Pupils were equal, round and responsive to light and accommodation. No afferent pupillary defect was present in the right eye. Extraocular muscles were full with good alignment and without subjective diplopia. Ptosis was not evident in either eye. Red cap test was reported equal for both eyes. Biomicroscopic examination revealed significant corneal epithelial basement membrane disruption in each eye and greater in the rightâ€”it encroached upon the visual axis on that side. There was no evidence of associated epithelial erosion, subepithelial microcystic edema, stromal edema or defect in either eye. The endothelium was intact in both eyes. Grade IV angles were viewed in both eyes, and each demonstrated a deep and quiet anterior chamber. Her lenses were clear in both eyes. Dilated ophthalmoscopic evaluation of both eyes demonstrated unremarkable vitrea, peripheries, posterior poles and vessels. There was no evidence of maculopathy in either eye, and cup-to-disc ratios were 0. Diagnosis Based on the findings and bilateral presentation, I diagnosed the patient with epithelial basement membrane corneal dystrophy O. Note the central epithelial basement membrane dystrophy EBMD in the visual axis of the right eye left. In the left eye, note the trace paracentral EBMD right. Treatment Strategy Because of the increased incidence of secondary epithelial edema and erosion, she was placed on a treatment plan that utilizes frequent topical hyperosmotics: Due to the chronic nature of the condition, involvement of the visual axis and decrease in visual acuity, phototherapeutic keratectomy was recommended for the right eye. Considering the early basement membrane disruption present in the left eye, we gave the patient the option of bilateral PTK with additional simultaneous photorefractive keratectomy PRK O. She had been a successful monovision soft contact lens wearer; so, a monovision treatment would be an ideal choice to consider. Taking into account her age and history of successful monovision contact lens wear with a dominant left eye, a target remaining refractive error of We educated the patient about the limitations inherent to monovision correction regarding reduced binocularity and overall acuity. Additionally, per protocol, she completed and signed a surgical consent before receiving the treatment, which was scheduled for the following month. But, trace EBMD can still be seen superiorly outside the treatment zone. The lenses provided good coverage, centration and movement on each eye. She was prescribed Vigamox moxifloxacin 0. She was compliant with her postoperative instructions. Both her distance and near vision preliminarily represented the targeted monovision effect. Biomicroscopic examination revealed a properly fitting bandage contact lenses over an expected large area of corneal epithelial defect in each eye. Neither cornea exhibited any indication of ensuing infiltrative keratopathy or edema. Additionally, the anterior chamber appeared clear

in each eye with no evidence of surgically induced cell or flare. We directed the patient to continue wearing the bandage contact lenses until full epitheliazation was completeâ€”probably for an additional 48 to 72 hours. We also told her to continue her topical medications as instructed, and we scheduled a follow-up in three days. Three-Day Follow-Up She returned for her three-day follow-up and saw continued improvement in her vision and comfort. Biomicroscopic evaluation of each eye revealed a characteristic central vertical seam of epithelium that signified a sealed, re-epithelialized corneal surface beneath the bandage lenses. There was no sign of subepithelial infiltrates or edema. The anterior chamber was clear and quiet in both eyes. With corneal re-epithelialization complete, the contact lenses could be safely removed and the topical antibiotic Vigamox discontinued. But, we directed the patient to continue the Flarex 1gtt q. She was scheduled for a one-week follow-up visit. One-Week Follow-Up She returned as scheduled for her one-week visit reporting clear vision both far and near, as well as good comfort. Her refraction of Biomicroscopic examination revealed only a trace remnant of the epithelial seam in each eye and no evidence of secondary keratopathy or anterior chamber reaction O. She was advised to slowly taper the Flarex over the next week and was scheduled to return in three weeks. Three-Week Follow-Up She returned for her three-week visit describing excellent vision and comfort. Biomicroscopic examination demonstrated a clear central cornea in each eye with no indication of disruption; however, trace dystrophy was visible outside the treatment zone, superior to the visual axis O. Understanding the inherited etiology of EBMD, we discussed the possibility of recurrence to some degree or into the visual axis. I asked the patient to return in three months or as needed if she experienced a change in vision or developed discomfort. Discussion A dystrophy is essentially a genetically acquired condition that manifests itself later in life. Interestingly, the classic definition describes a dystrophy as a degenerative disorder caused by inadequate or defective nutrition. As inherited conditions, they typically affect both eyes, although asymmetric disease progression may occur, which can create a more challenging initial presentation and diagnosis. The pathomorphology and pathophysiology of the corneal dystrophies is specific to the anatomic level of the disease process. With respect to EBMD, a progressive pathology occurs, often after the forth decade of life, at the level of the epithelium and its corresponding basement membrane, producing an interruption of cellular integrity and tissue function. However, many cases of EBMD can be observed clinically without the patient complaining about or even being aware of any signs or symptoms. A number of treatment modalities are available, depending on the severity of the dystrophy, the development of RCE, the location with respect to the visual axis and ultimately, the effect on patient comfort or vision. Topical hyperosmotic solutions and ointments, epithelial debridement, bandage contact lenses, anterior stromal puncture, oral antibiotics and phototherapeutic keratectomy PTK are viable considerations. In the case of EBMD resistant to traditional treatment, such as topical hyperosmotics or epithelial debridement, and if the EBMD is producing chronic visual disturbances or pain secondary to epithelial disruption, edema or erosion, PTK can be an ideal treatment option. The process is quick, precise, relatively painless and fast-healing. Zones of epithelial and basement membrane involvement are often permanently eliminated with a high degree of success and alleviation of symptoms. Additionally, the option of incorporating a refractive component into the procedure by adding photorefractive keratectomy PRK to the treatment plan allows for an even higher level of patient satisfaction. In its earliest clinically apparent stages, the natural progression of the dystrophy can be quite unpredictable with respect to speed, direction and degree of keratopathy formation. During its course, keratometric and related refractive changes, including irregular astigmatism, may become more frequent. They can vary in size from approximately 1mm to several millimeters in width. They can be round, comma-shaped or irregular and are usually 0. Blebs or epithelial bullae are a less common manifestation of map-dot-fingerprint dystrophy and are localized areas of fibrillogranular material or thickened basement membrane. Particularly, abnormal basement membrane has been examined in this manner showing faulty anterior protrusions toward associated epithelium thereby contributing to poor adhesion and resultant pathology. The most common secondary corneal sequelae evident on slit lamp biomicroscopy are microcystic edema and episodes of recurrent corneal erosion, which, of course, directly relate to patient symptoms and comfort. As exhibited in the case of our patient, central corneal involvement into the visual axis increases the likelihood of a consequent reduction or fluctuation in visual acuity. The pathophysiology of EBMD leading to

RCE can be best understood by considering the known mechanism in which corneal epithelium produces and normally tightly adheres to its underlying basement membrane. Faulty basement membrane production, which is thickened, multilaminar and misdirected into the epithelium, disrupts this normally congruous relationship. Deeper epithelial cells that normally migrate to the surface can become trapped. Epithelial cells anterior to the aberrant basement membrane may have difficulty forming viable hemidesmosomes and basement membrane complexes, which normally attach to the underlying stroma, ultimately resulting in recurrent erosions. The main strategy is to educate and reassure the patient that most cases of basement membrane dystrophy are asymptomatic, and to reassure him or her that observation is the only necessary long-term approach. In the event of progressive keratopathy with frequent RCE associated with pain or a reduction in VA, however, more aggressive medical or surgical treatment options may be indicated. Certainly, taking a stepped, methodical approach to treatment will be best tolerated by the patient, considering that initial non-invasive medical therapies are often successful. With recalcitrant cases of RCE, hyperosmotics can be prescribed indefinitely if effective and tolerated well by the patient. Bandage contact lenses with prophylactic topical antibiotic therapy can be used effectively with acute erosions until re-epithelialization is accomplished. Oral doxycycline and minocycline also have a stabilizing effect on the corneal epithelium and basement membrane by decreasing the amount of fatty acids and metal metalloproteinases MMP-2 and MMP-9 found in the tear film. One study concluded that a five-year cumulative probability of recurrence of ABMD after mechanical debridement was favorable, at No reported recurrences of dystrophic basement membrane were discovered within the treatment zones during this time period. Anterior stromal puncture with insulin needles or nd: The successful case presented resulted in corneal clarity and improvement in corrected vision, which is exemplary of results expected when proper preoperative conditions are present and surgical protocol is followed. Provided any contraindications to excimer laser photoablation do not exist e. A study found that eyes with map-dot-fingerprint dystrophy can also have irregular corneal cylinder, producing fluctuation or reduction in visual acuity. With a reduction of aberrations secondary to EBMD via primary PTK, the inclusion of initial wavefront data into a subsequent refractive PRK treatment plan should be questioned and perhaps omitted. Long-term data suggest that most patients treated with PTK do not develop recurrences and that side effects are minimal.

Chapter 2 : - The Multimedia Atlas of Videokeratography (CD-ROM for Windows) by Michael K. Smolek

THE MULTIMEDIA ATLAS OF VIDEOKERATOGRAPHY by SMOLEK. New. Like New Book, Fast Delivery, Best Customer blog.quintoapp.com Do Not Ship PO BOX, APO, FPO ADDRESS.

The plaintiff claimed that he suffered distorted and blurred vision, particularly in his left eye, eight months after the procedure because doctors failed to diagnose keratoconus. To avoid similar lawsuits, we need a greater understanding of postoperative ectasia and its potential warning signs before we refer patients for LASIK. Here, well review some of the latest research on this potentially debilitating disorder. Mapping Out Keratoconus Keratoconus is a bilateral progressive disease, and although moderate or advanced cases should be detectable, mild cases often are not clinically pronounced. Research using advanced diagnostics may at least help raise red flags to warn of potential ectasia. One abnormal map does not usually indicate forme fruste keratoconus. Still, you should educate the patient, or have him or her return in six to 12 months to check for changes to the corneal surface. Two abnormal maps may indicate early keratoconus. If topography does not indicate forme fruste keratoconus but there are two abnormal maps, surface ablation would likely be a better procedure than LASIK. Three or more abnormal maps mean that corneal surgery is contraindicated. These patients have a high risk of developing ectasia. Additional Indicators There are several other indicators to help you gauge a patients risk of ectasia. Although this is still a good indicator of ectasia, you may need to measure beyond the central 3mm of the cornea because keratoconus and pellucid marginal degeneration PMD often affect the mid- and peripheral cornea. On the Orbscan, irregularity at 3. Some researchers believe that all keratoconus begins on the posterior corneal surface. Research at our center suggests that a peripheral usually inferior cornea that is not 20m thicker than the central pachymetry raises suspicion for forme fruste keratoconus or an increased risk of post-LASIK ectasia. The peripheral cornea normally shows significant thickening from the central cornea. An increase in higher-order aberrations might also be an indicator of early keratoconus. If one or more indicators are suspicious, have the patient return in six-months for repeat measurement. Most patients we reviewed who developed ectasia had four or more of the indicators listed above. An understanding of early-stage and forme fruste keratoconus is critical for preventing post-LASIK ectasia, preserving the patients visual quality and protecting your practice from lawsuits. Referral patterns, treatment management and visual outcome in keratoconus. Eye ;12 Pt 4: Treatment of mild to moderate keratoconus with laser in situ keratomileusis. J Cataract Refract Surg Dec;25 Ophthalmology Feb; 2: Repeatability and agreement of two corneal-curvature assessments in keratoconus: Collaborative Longitudinal Evaluation of Keratoconus. Cornea May;17 3: Surface and Orbscan II slit-scanning elevation topography in circumscribed posterior keratoconus. J Cataract Refract Surg Mar;31 3: Subclinical keratoconus diagnosis by elevation topography. Arch Soc Esp Oftalmol Dec; 78 Role of Orbscan II in screening keratoconus suspects before refractive corneal surgery. Ophthalmology Sep; 9: Early onset ectasia following laser in situ keratomileusus: J Refract Surg Mar-Apr;18 2: Cornea Jul;23 5: Corneal topography and thickness in keratoconus. Chopra I, Jain AK. Between eye asymmetry in keratoconus in an Indian population. Clin Exp Optom May;88 3: Between-eye asymmetry in keratoconus. Cornea Oct;21 7: Validation of the estimation of corneal aberrations from videokeratography in keratoconus. J Refract Surg May-Jun;18 3: Wavefront aberrations measured with Hartmann-Shack sensor in patients with keratoconus. Ophthalmology Nov;

Chapter 3 : Contact Lens Optics And Lens Design By William A. And Ph.d. Douthwaite at blog.quintoapp.c

Multimedia Atlas of Videokeratography, 1e by Michael K. Smolek PhD and a great selection of similar Used, New and Collectible Books available now at blog.quintoapp.com

Corneal Mapping Corneal topography, also known as photokeratoscopy or videokeratography, is a non-invasive medical imaging technique for mapping the surface curvature of the cornea, the outer structure of the eye. The three-dimensional map is therefore a valuable aid to the examining ophthalmologist or optometrist and can assist in the diagnosis and treatment of a number of conditions; in planning refractive surgery such as LASIK and evaluation of its results; or in assessing the fit of contact lenses. A development of keratoscopy, corneal topography extends the measurement range from the four points a few millimeters apart that is offered by keratometry to a grid of thousands of points covering the entire cornea. The procedure is carried out in seconds and is completely painless. Special thanks to the EyeGlass Guide, for informational material that aided in the creation of this website. Visit the EyeGlass Guide today! Many eye diseases, if detected at an early stage, can be treated successfully without total loss of vision. Your retinal Images will be stored electronically. This gives the eye doctor a permanent record of the condition and state of your retina. This is very important in assisting your Optometrist to detect and measure any changes to your retina each time you get your eyes examined, as many eye conditions, such as glaucoma, diabetic retinopathy and macular degeneration are diagnosed by detecting changes over time. The advantages of digital imaging include: Quick, safe, non-invasive and painless Provides detailed images of your retina and sub-surface of your eyes Provides instant, direct imaging of the form and structure of eye tissue Image resolution is extremely high quality Uses eye-safe near-infra-red light No patient prep required Digital Retinal Imaging Digital Retinal Imaging allows your eye doctor to evaluate the health of the back of your eye, the retina. It is critical to confirm the health of the retina, optic nerve and other retinal structures. The digital camera snaps a high-resolution digital picture of your retina. This picture clearly shows the health of your eyes and is used as a baseline to track any changes in your eyes in future eye examinations. Similar to ultrasound, this diagnostic technique employs light rather than sound waves to achieve higher resolution pictures of the structural layers of the back of the eye. A scanning laser used to analyze the layers of the retina and optic nerve for any signs of eye disease, similar to an CT scan of the eye. It works using light without radiation, and is essential for early diagnosis of glaucoma, macular degeneration and diabetic retinal disease. With an OCT scan, doctors are provided with color-coded, cross-sectional images of the retina. These detailed images are revolutionizing early detection and treatment of eye conditions such as wet and dry age-related macular degeneration, glaucoma, retinal detachment and diabetic retinopathy. An OCT scan is a noninvasive, painless test. It is performed in about 10 minutes right in our office. Feel free to contact our office to inquire about an OCT at your next appointment. With digital imaging through our iVue OCT, we can assess the health of your retina, optic disc and the cornea at a detailed level to help detect signs of eye disease. The value to identify early signs of disease before they may be noticeable on a clinical exam can save your eyes from potential vision loss. An initial visual field screening can be carried out by the optometrist by asking you to keep your gaze fixed on a central object, covering one eye and having you describe what you see at the periphery of your field of view. For a more comprehensive assessment, special equipment might be used to test your visual field. In one such test, you place your chin on a chin rest and look ahead. Lights are flashed on, and you have to press a button whenever you see the light. The lights are bright or dim at different stages of the test. Some of the flashes are purely to check you are concentrating. Each eye is tested separately and the entire test takes minutes. These machines can create a computerized map out your visual field to identify if and where you have any deficiencies. The retina is the part of your eye that captures the image of what you are looking at, similar to film in a camera. Many eye problems can develop without you knowing. You may not even notice any change in your sight. But, diseases such as macular degeneration, glaucoma, retinal tears or detachments, and other health problems such as diabetes and high blood pressure can be seen with a thorough exam of the retina. A scan to show a healthy eye or detect disease. A permanent record for your file, which allows us to view your images each year to look for

changes. To have the exam, you simply look into the device one eye at a time and you will see a comfortable flash of light to let you know the image of your retina has been taken. While a traditional ophthalmoscope allows the optometrist to see only 10 degrees of the retina at any given time, the new Daytona technology allows us to see almost the entire retina capture a highly detailed image of over 80 degrees of the retina in one picture. Daytona retinal scan technology is now available at In-Sight Optical and could be a part of your comprehensive eye examination. Although topography helps the fitting of specialty contact lenses, the exceptional accuracy through mapping of the cornea can capture the makeup of the tear layers. MGD or meibomian gland dysfunction is the leading cause of dry eye disease, and through a LipiScan, our optometrists can analyze the meibomian glands and determine the specific treatment required to restore proper tear production.

Chapter 4 : Some OPTICAL and BLUR papers

2 Atlas of Ophthalmology 3 Atlas of Ophthalmology (the Multimedia atlas of videokeratography) 4 ; Basic Ophthalmology Thomas farrell. 5: Brain Atlas for Functional Imaging.

Field of Invention The field of the currently claimed embodiments of this invention relates to systems and methods for detecting and classifying the severity of retinal disease. Discussion of Related Art Age-related macular degeneration AMD is the leading cause of blindness if left untreated throughout much of the western world for individuals over age Vision loss can occur from the advanced stage, which includes choroidal neovascularization CNV or geographic atrophy involving the center of macula. The advanced stage can lead to severely impaired central vision, impacting everyday activities2. In the United States, approximately , individuals over the age of 50 develop the advanced stage of AMD each year in at least one eye3. Furthermore, of those patients who developed advanced AMD in only one eye, approximately half will develop the advanced stage in the other eye within 5 years, resulting in a high risk of developing legal blindness if left untreated1. In addition, recent clinical trials of anti-vascular endothelial growth factor VEGF for treating CNV can eliminate a substantial proportion of cases which otherwise would progress to the advanced stage5. The better the visual acuity at the onset of anti-VEGF therapy, the greater is the chance of avoiding substantial visual acuity impairment or blindness2. Thus, it is critical to identify in a timely manner those individuals most at risk for developing advanced AMD, specifically, individuals with the intermediate stage of AMD. The intermediate stage of AMD is characterized by the presence of numerous medium-sized drusen, or at least one large druse within microns of the center of the macula FIG. While a dilated ophthalmoscopic examination at least every 2 years to detect asymptomatic conditions potentially requiring intervention, such as the intermediate stage of AMD, is recommended by the American Academy of Ophthalmology [AAO PPP], the presence of drusen often causes no symptoms and therefore no motivation for an individual to seek examination by an eye care provider to detect an asymptomatic intermediate stage. Currently, ophthalmoscopy of the retina by trained health care providers including ophthalmologists or evaluation of fundus photographs by trained graders including ophthalmologists remains the most effective method to identify the intermediate stage of AMD1. However, grading fundus images manually by a grader can be a tedious process requiring the expertise of an adequately trained health care provider or extensively trained fundus photograph grader to understand the varying patterns recognized by an ophthalmologist7. Furthermore, access to an ophthalmology health care provider at least every 2 years to detect the intermediate stage of AMD after age 50 can be challenging for many health care environments. Therefore, there is a need for automated visual diagnostic tools to facilitate the detection of the intermediate stage AMD among a large pool of the at-risk population. As an example of the potential health care burden of this issue, in , in the United States, there were about 98 million individuals over the age of 50 and this number is projected to increase to approximately million by A system for detecting, and classifying severity of, a retinal disease according to an embodiment of the current invention includes a retinal scanner constructed to obtain retinal images of an individual, and a data processing system in communication with the retinal scanner. As is seen in these images, the background retina can show variations in hue and the retinal fundus images may have various artifacts. In describing embodiments, specific terminology is employed for the sake of clarity. However, the invention is not intended to be limited to the specific terminology so selected. A person skilled in the relevant art will recognize that other equivalent components can be employed and other methods developed without departing from the broad concepts of the current invention. All references cited anywhere in this specification, including the Background and Detailed Description sections, are incorporated by reference as if each had been individually incorporated. A substantial body of work has been devoted to the design of automated retinal image analysis ARIA algorithms. While ARIA algorithms for diabetic retinopathy or glaucoma are showing promise9, less progress, in the opinion of the authors, has been made in the area of AMD. Some AMD detection methods require user intervention Recently, researchers have emphasized automated approaches by using adaptive equalization and wavelets11; employing mathematical morphologyl2 on angiographic images;

using adaptive thresholding13; exploiting probabilistic boosting approaches for the classification of non-homogeneous drusen textures14; using probabilistic modeling and fuzzy logic15; employing histogram normalization and adaptive segmentation16; exploiting texture discrimination and the intensity topographical profile17; utilizing morphological reconstruction18; employing a histogram-based segmentation method19; or, finally, using basic feature clustering to find bright lesions The interested reader is also referred to a recent review9 of ARIA techniques. Because the key factor in mitigating the worsening of AMD as it progresses from the intermediate stage to the neovascular form and potentially, in the future, the geographic atrophic form is early intervention, an application of the current invention can be to implement these algorithms in a public monitoring or screening system that is convenient and easily accessible to the general public. In essence, a system according to an embodiment of the current invention can analyze fundus images of an individual and quickly provide results including a grade of AMD severity and, if necessary, a recommendation to see an ophthalmologist for further evaluation, while avoiding false positive referrals. A natural approach for finding and classifying AMD patients can include automatically finding drusen in fundus images which is the aim of most of the above cited studies and then using this to detect and classify the severity of AMD. This task may be difficult due to variations in patient specific appearance variability in pigmentation of the choroid as well as drusen appearance within and across subjects , and it may be challenging to identify stable image features that are characteristic of drusen that can be used to build a robust classifier that will perform reliably over a large dataset. In contrast, an embodiment of the current invention uses an alternate strategy that focuses on classifying the entire fundus image, as a whole, as opposed to looking only for specific drusen or other lesions. The following will describe some concepts of the current invention in the context of an application to AMD detection and classification. The broad concepts of the current invention are not limited to the particular embodiments and examples. This method was first used in the field of automated text classification. For example, suppose that the problem is to teach a computer to distinguish among newspaper articles on three news categories such as politics, sports, and business. The first step of this method is to determine what are the salient words, i. Next, a training phase is used in which the algorithm is provided example articles on the three news categories. During the training phase the algorithm is told under which category each article falls, and it infers the relative frequency histograms of all selected keywords in each article category. Given a corpus of new and uncategorized articles, the method would then categorize each article by looking at the frequency of each keyword it contains and selecting the category that has the closest histogram. This entire approach can be transposed to the problem of classifying retinal images into different categories of affected eyes, by substituting newspaper articles with fundus images and visual words with visual features computed in these fundus images. Recently the visual words approach has been adapted by the computer vision community26 to perform classification of images. After all visual features in a set of training images have been detected, a K-means clustering approach can be used to find centroids of the features. The set of training images is used once again to find the relative frequency of each of the visual words from images of each AMD category, forming prototypical visual words histograms that are characteristic of each AMD image category. As was described earlier, any new test image is then simply classified as follows: Other than selecting the number of visual words and providing images for training, the method does not need any additional input or supervision and is agnostic to the type of category or classification it is applied to. Pre-Processing to Obtain Region of Interest. Retinal images almost always have a black border that needs either to be avoided or eliminated. Within the AREDS database there are many images where the macula is off center, the border is lighter than pure black from flash or other photographic artifacts, red timestamps are placed on the border, or other artifacts are present besides the desired retinal area see FIG. To accurately and consistently obtain the region of interest ROI , the following steps are used: Images are affected by various degrees of intensity gradient variation that depends on the acquisition conditions. To remove this background intensity gradient, a new image is created by the following: To find keypoints i. The SURF algorithm exploits a technique known as integral images to quickly find the image second derivative the Hessian and apply approximate Gaussian filters at multiple scales. Each scale is known as an octave, and each application of the Gaussian filter forms one layer. Here, keypoints are detected using ten octaves, three layers per octave, and a Hessian threshold of

These 3 descriptors are then concatenated into one. This aids in classification because color is an important visual cue in finding retinal anomalies. In particular, metrics for measuring distance between colors are essentially Euclidian. Furthermore, tones Lightness and colors the a channel is green or magenta hue, and the b channel is blue or yellow hue are held separately; thus, one can vary one without altering the other. A vocabulary of visual words is created from the keypoint descriptors of the set of AMD-positive i. The rationale for not including all images is that AMD-positive images contain all features vessels, optical disk, artifacts that are present in AMD-negative images plus drusen and other lesions geographic atrophy, pigmentation, and other features. A vocabulary of visual words for two-class classification problems is used, and visual words for three-class problems. The visual words are selected as the centroids found using K-means clustering. We emphasize here that this needs to be done only once; the same vocabulary is used for each subsequent run. To reflect the fact that AMD severity is graded by taking into account the location of the drusen and other AMD-related lesions, with the macular region taking a preponderant weight in the decision process see FIG. This is based on subdividing the fundus image in pre-defined concentric regions. Several options are considered and compared in the Examples section below see FIG. Consequently, based on their distance from the center of the image which corresponds approximately to the macula in most images , feature descriptors are grouped into several different sets and importance weights are applied to the histograms of each region based on distance of the region from the center, to emphasize regions close to the macula. Regional histograms are then concatenated back into a single large histogram for the entire image. The entire corpus of available images and their associated category labels is then used for training and testing. For each image, a final feature vector visual word histogram is generated once and for all. As is standard in machine learning applications, a N-fold cross validation approach is used. This consists of subdividing the dataset into N equally sized folds i. Then, a random forest classifier is trained using the training dataset. The random forest algorithm uses the consensus of a large number of weak only slightly better than chance binary decision trees to classify the testing images into different severity classes. In other words, visual word histograms for use as a reference are generated. Although all of the steps described in FIG. For example, some embodiments may include more or less of the processing summarized in item 2, or may even skip it altogether. Again, some embodiments can include all of the listed processes, while other embodiments can include a subset of the processes. More generally, a method of detecting, and classifying severity of, a retinal disease using retinal images according to an embodiment of the current invention includes at least one of receiving, retrieving or generating reference data that includes information concerning occurrences of key image features for each of a plurality of retinal disease and disease severity conditions. The reference data can be generated according to the flow chart of FIG. In some embodiments, the reference data may have been previously generated and the data could then be retrieved from data storage, for example, or could be provided by an external source such as by way of a data network, for example. The method further includes receiving a retinal image of an individual. However, retinal images from other systems can also be used according to other embodiments of the current invention. The method further includes processing the retinal image of the individual to identify occurrences of each of a plurality of distinguishable image features throughout at least a region of interest of the retinal image. The method further includes identifying which ones of the identified occurrences of the plurality of distinguishable image features of the retinal image of the individual correspond to the key image features of the reference data; calculating, based on the identifying, a number of occurrences of each of the key image features in the retinal image of the individual; and determining at least one of a likelihood of a presence of a retinal disease or a likelihood of developing a retinal disease based on a comparison of the number of occurrences of each of the key image features in the retinal image of the individual to the reference data. In some embodiments, the method can further include determining a likelihood of a severity of the retinal disease based on the comparison of the number of occurrences of each of the key image features in the retinal image of the individual to the reference data. Although some examples described in this specification use a specific number of severity levels, such as four, the general concepts of the current invention are not limited to a particular number of severity levels. There could just be one level in some embodiments, i. In some embodiments, the processing of the retinal image of the individual to identify occurrences of each of the plurality of

distinguishable image features includes applying a plurality of image operators to the retinal image. In some embodiments, the method can further include receiving non-image information regarding the individual. The determining at least one of the likelihood of the presence of the retinal disease or the likelihood of developing the retinal disease can be further based on the non-image information regarding the individual. In some embodiments, the method can further include, prior to the providing reference data, generating the reference data based on processing a plurality of expert-classified retinal images that have been classified according to at least one of risk of developing a retinal disease, retinal disease type or retinal disease severity. In some embodiments, the generating the reference data can include processing the plurality of expert-classified retinal images to identify occurrences of each of a plurality of distinguishable reference image features, identifying key image features corresponding to the plurality of expert-classified retinal images, and computing a frequency of occurrence of each of the key image features corresponding to each classification of the expert-classified retinal images. In some embodiments, the identifying key image features can use a statistical clustering process. In some embodiments, the identifying the key image features can use at least one of a K-means, Mean Shift, Expectation maximization or Support Vector Data Description process, for example. The following is a list of retinal diseases to which this method could apply. However, applications of the current invention are not limited to only the listed retinal diseases.

Chapter 5 : Laser in situ Keratomileusis (LASIK) - American Academy of Ophthalmology

Buy Multimedia Atlas of Videokeratography: Windows 95 by Michael K. Smolek PhD (ISBN:) from Amazon's Book Store. Everyday low prices and free delivery on eligible orders.

Technology Opportunities and Challenges Abstract: The insatiable demand for media rich content and the increasing availability of advanced devices such as smart phones, tablets, etc. Some of the options being mentioned as ingredients for such 5th Generation mobile radio systems include Small Cells, HetNets, Carrier Aggregation, Machine-to-Machine, Internet-of-Things, Relays, Device-to-Device and operation in the millimeter wave spectrum range, among others. A review some of the background trends driving the evolution of broadband wireless access that will impact the technology choices beyond is considered in this talk. Also some detail of the most intriguing options service providers is included. Analysis, Detection, and Tolerance Abstract: However, the manifestation of such faults and the available techniques for detecting them and for tolerating them are very different. We then analyze their behavior and identify their possible source. We describe an algorithm capable of detecting these faults during the normal operation of the sensor. Such an online detection allows us to develop efficient techniques for greatly reducing their impact on the quality of the image. We next focus on soft errors a. This analysis provides important information about the nature and distribution of particle hits and their occurrence rate, and increases our understanding of SEUs in regular ICs as well as in camera sensors. Online Voting, Issues and Opportunities Abstract: We give a short history of online voting and then turn to opportunities for making advances in this important governmental information service, including providing observations on the potential for blockchain technology to contribute to online voting systems. Power system electromechanical oscillations: Poorly damped or even undamped electromechanical oscillations may ccur in power systems putting at risk the security of electricity supply. The study of power system electromechanical oscillations is aimed at the design of control schemes to improve their damping. A very successful approach to the study of power system electromechanical oscillations is based on modal analysis. Modal content can be determined by the eigenvalue analysis of the power system linear model and can also be estimated from power system signals. The lecture will review the a number of mathematical techniques of modal analysis and estimation. It will also explain how the outcome of modal analysis and estimation can be used for the design of control schemes. We will first talk about recent advances in artificial intelligence AI. We will also give the concepts and related technologies of ambient intelligence AmI. We will then discuss the issues of utilizing robots and AI in elderly care. Ideas of two research projects in elderly home care will be presented. The first project is about developing a virtual human companion. The second one is related to the detection of abnormal behavior of the elderly at home with RFID. Industrial revolutions have different stages during their development. The first one has used steam power in mechanical production systems The second one has used electrical power for assembly lines and mass production The third one has used electronics and information technology to boost the automation and autonomous systems Recently, the German industry has launched the fourth one using cyber-physical production systems; that means the real and virtual worlds can be merged The fourth industrial revolution integrates the following fields: This talk will represent the opportunities geographical location, materials and energy, infrastructure, different industries â€¦etc and challenges education development, industry needs, workforce training, collaboration between industry and universities, road map for technology â€¦etc in Egypt to enter the age of industry 4. After the public revolution in Egypt , the government hopes to improve the education quality and to increase the economic revenue in applying the strategic plan The higher education in engineering, technology, and business has to integrate new knowledge and skills to empower the local industry and to improve the industrial productivity. The buffer for incoming data in the servers has to match the speed of the incoming data with the speed of the server in the datalink. Similarly, the buffer for outgoing data has to match the speed of the outgoing link with the speed of the server for smooth transfer of incoming data to the destination after service. Depending on the speed mismatch among the links and servers, a server may become idle, underused, or overloaded to a level that the limited size of the buffers may not be able to prevent

congestion or loss of data in either or both incoming and outgoing directions. This degradation in the quality of service will result in longer delays, loss of data, and blocking of new incoming data. Dependable Cyber-Physical Systems Abstract: In this new era of Cyber-Physical systems and Internet of Things, software system developers have to deal with increasing complexity of huge and heterogenous systems. Building distributed, asynchronous, and event-based systems is a complicated task. We need models, techniques, and tools to address the complexity of the software, as well as timeliness. Moreover, software needs to react to the uncertainty and possible changes in the system and environment. A family of actor-based languages are introduced to enable model driven development and provide a natural and usable model for building distributed, asynchronous, and event-based systems with least effort. Network and computational delays, periodic events, and required deadlines can be expressed in the model. To provide dependability in the context of a model-driven approach, model checking and simulation tools are built based on the formal semantics of the language. For deadlock-freedom and schedulability analysis special techniques in state space exploration is proposed by exploiting the isolation of method execution in the model. I will show how these models can be used in safety assurance and performance evaluation of different systems, like Network on Chip architectures, sensor network applications, train scheduling, and quadricopters. Biomedical Image Analysis and Visualization: Current Trends and Future Perspectives Abstract: Innovative imaging and screening technologies have become fundamental to scientific progress across all disciplines of natural and life sciences. However, the actual bottleneck often lies in the handling and analysis of the vast amounts of complex data generated through these technologies, which requires expert knowledge for analysis and visualization. Since analysis and visualization have become a real bottleneck in biomedical sciences, such data provides interesting and challenging research questions from a computer science point of view. In this talk, a review of interdisciplinary projects addressing the analysis of challenging biomedical image data such as whole-slide images in digital pathology and real-time biological video data is provided. Finally, future challenges for biomedical image analysis are discussed. Internet of Things IoT: From Sensors to Cloud Abstract: It enables the objects to collect, share, and analyze data. The IoT has become an integral part of our daily lives through applications such as public safety, intelligent tracking in transportation, industrial wireless automation, personal health monitoring, and health care for the aged community. IoT is one of the latest technology that will change our lifestyle in coming years. Experts estimate that as of now, there are 25 billon connected devices, and by it would reach to 50 billion devices. This lecture aims to introduce a practical low-cost IoT Platform. The foundations of IoT will be discussed throughout real applications. Challenges and constrains for the future research in IoT will be discussed. In addition, research opportunities and collaboration will be offered for the attendees. Intelligence in the cyber-physical revolution Abstract: The emergence of non-trivial embedded sensor units and cyber-physical systems has made possible the design and implementation of sophisticated applications where large amounts of real-time data are collected, possibly to constitute a big data picture as time passes. Within this framework, intelligence mechanisms play a key role to provide systems with advanced functionalities. Intelligent mechanisms are needed to guarantee appropriate performances within an evolving, time invariant environment, optimally harvest and manage the residual energy, identify faults within a model-free framework, solve the compromise between output accuracy and computational complexity. The talk will show how the above aspects of intelligence are needed to boost the next generation of cyber-physical-based and Internet of Things applications, generation whose footprint is already around us. In recent years, 2D barcodes, such as QR codes, have been widely used as a ubiquitous gateway to access the content of the online cyber world from the offline physical world. In mobile marketing applications, barcode scanning has become the most popular way to disseminate advertisement content to potential customers. Unfortunately, the conventional 2D barcodes are often too obtrusive in their appearance for integrating into an aesthetically designed advertisement, especially for expensive branded products. In addition, they may not be very effective in engaging potential customers since human understandable visual information, such as a picture, is either completely absent or too small to see, before the barcode is successfully decoded. In this presentation, a novel picture-embedding 2D barcode, called PiCode, which mitigates these two limitations by equipping a scannable 2D barcode with a picturesque appearance. PiCode is designed with careful

considerations on both the perceptual quality of the embedded image and the decoding robustness of the encoded message. Comparisons with the existing beautified 2D barcodes show that PiCode achieves one of the best perceptual qualities for the embedded image, and maintains a better tradeoff between image quality and decoding robustness in various application scenarios. PiCode has been implemented in the form of a mobile application software in both the Android and iOS platforms. The practicality of PiCode has been successfully demonstrated in several real-world exhibition events in Hong Kong. The signal variances in various frequency bands are analyzed by interpolation Deslauriers-Dubuc wavelets in a constant data stream that can be implemented efficiently by a multirate polyphase system with critical downsampling. Audio signals with Laplacian amplitude variance statistics can be decorrelated using this method to make lossless data compression possible. The actual data compression is done by variable bit allocation in dependence of the signal amplitude variances in the individual frequency bands using the "Greedy Bit Allocation" algorithm that yields a constant quantization error over all frequency bands independently of the individual signal amplitude variances for a constant overall data rate. Speaker localization under reverberation and noise Abstract: Speaker localization is important for applications of audio signal processing, including speech communication, video conferencing and robot audition. Most current methods use microphone arrays and information based on the expected phase and amplitude differences between microphones as a function of the wave arrival direction. However, in rooms with reverberation, the direct sound is contaminated by reflections and localization typically fails. Recently, a reverberation-robust localization method was proposed for spherical microphone arrays, which uses only the direct-path bins in the short-time Fourier transform of the speech signals. These bins are selected according to the ratio between the first two singular values of the spatial spectrum matrix. Then, the direction-of-arrival at each selected bin is estimated using the MUSIC algorithm, formulated in the spherical harmonics domain. The collection of estimated directions for all selected bins is classified using Gaussian mixture model, and the speaker direction is computed as the mean of the dominant Gaussian. With this approach, correct speaker localization can be performed even under high levels of reverberation and noise, and for relatively long distances between the speaker and the microphone array. This talk will present the theory of the method, illustrating its performance using simulated and experimental data. Towards Exascale Computing Abstract: Due to hardware limitations, parallel computing became an integral part of our lives that it is hard to imagine a device that is not using multiprocessor power, including smartphones. What started as a hardware solution to physical limitation, prompted software engineers to adopt to parallelism. This in turn, compelled theoretical computer scientists to develop theoretical solutions to algorithms design and analysis to provide a solution that is parallel oriented rather than a serial oriented one, using divide-and-conquer algorithm design technique. As we move towards exascale computing and beyond, we need to keep in mind that the power of humanity is not in the powerful machines we develop, but remains in our intelligence and ability to develop solutions to problems at the basic level.

Chapter 6 : Diurnal Variation of Corneal Topography After Radial Keratotomy | JAMA Ophthalmology | JAM

2 Atlas of Ophthalmology 3 Atlas of Ophthalmology (the Multimedia atlas of videokeratography) 4 ; Basic Ophthalmology Thomas farrell. 5: Brain Atlas for Functional.

To report the outcomes of intrastromal corneal ring segment ICRS implantation in patients with keratoconus using a new nomogram. Retrospective case series study of 22 patients 26 eyes who underwent ICRS implantation using the manual technique from July to July A self-designed decision-making nomogram was used. Eighty-one percent gained 1 to 11 lines of BCVA. No patient lost lines of visual acuity. This new nomogram improves the outcomes in patients with keratoconus. To determine and compare the changes in corneal density following two different protocols of accelerated corneal collagen crosslinking A-CXL in patients with progressive keratoconus. Corneal density was measured with Scheimpflug topography at 1, 3, 6, and 12 months of follow-up. Compared to preoperative values, corneal density significantly increased at 1 month and decreased over time in both groups. At 12 months, while densitometry returned completely to baseline values in Group B, it was slightly higher than preoperative values in Group A. High-energy exposure may tend to induce more haze at the early post-treatment period, but it is reversible. To evaluate the visual and refractive outcome of eyes treated with small-incision lenticule extraction SMILE in patients with myopic astigmatism. Outcome measures were corrected distance CDVA and uncorrected distance UDVA visual acuity; induced torsion and achieved corrections of sphere and cylinder were determined. Preoperative mean spherical equivalent was Refractive stability was achieved within 6 weeks. SMILE appears to be a predictable and effective procedure to treat myopic astigmatism; a small, significant undercorrection of the astigmatic error is present, specially in astigmatism over 3. KCN mean thinnest optical pachymetry Evaluation of keratoconus and suspect corneas highlights the importance of combining curvature, elevation, and pachymetry indices for the preoperative screening of keratorefractive surgery candidates. Evaluation of 3 IOLs for visual and reading performance and quality of life. Postoperatively, distance, intermediate, and near visual acuity VA , preferred near and intermediate reading distance, and a patient questionnaire were evaluated. Intermediate VA showed the opposite. There was no statistically significant difference between the groups regarding the perception of halos. No IOL was better in all aspects. Ninety-one percent of patients would recommend the procedure. A small number of patients had quality of vision symptoms 3 months after the Symfony IOL; however, there was a significant improvement in unaided vision as well as quality of life for distant and near activities. Mean binocular UDVA was Mean glare score was 1. The IC-8 provides good unaided acuity at a continuous range of distances. To evaluate outcomes of toric phakic implantable collamer lens ICL V4c for moderate to high myopic astigmatism. Prospective study includes 99 eyes of 53 patients who underwent toric ICL V4c. We assessed visual outcomes, refraction, safety, efficacy, predictability, stability, IOP, vaulting, and endothelial cell density ECD. After 2-year follow-up, average UDVA was 0. Paired t test was used. Toric ICL V4c implantation showed very good results for moderate to high myopic astigmatism. To compare high-order aberrations, Strehl ratio, modulation transfer function MTF , and corneal aspheric function after femtosecond laserâ€”assisted cataract surgery and traditional phacoemulsification. In a prospective study, 32 eyes of femtosecond laserâ€”assisted cataract surgery FLACS and 40 eyes of traditional phacoemulsification were studied. Wavefront aberrometry and visual quality were measured using the iTrace Hoya Ltd. Main outcomes included total internal aberrations, Strehl ratio, MTF, and corneal aspheric function. No statistically significant differences were found between corneal aspheric function measurements.

Chapter 7 : - The Multimedia Atlas of Videokeratography (CD-ROM for Windows) by Michael K. Smolek

Multimedia â€¢ CME â€¢ Publishing â€¢ Courses ACS Video Library; ACS Online Video Library; ACS Multimedia Atlas of Surgery; SAGES Video Based Education; Nursing.

Chapter 8 : Top Refractive Surgery e-Posters - International Society of Refractive Surgery

DOWNLOAD PDF THE MULTIMEDIA ATLAS OF VIDEOKERATOGRAPHY

The Multimedia Atlas Of Videokeratography Cd Rom For Windows Unnatural Creatures Stories Selected By Neil Gaiman Old Filth By Gardam Jane Europa Editions Paperback.

Chapter 9 : Laser in situ Keratomileusis (LASIK) - American Academy of Ophthalmology

Introduction To Black Gospel Piano Introduction to black gospel piano pdf download, introduction to black gospel piano gospel piano scales 6 different scales that can work now, were back for another "ask.