



پروژه درس روش پژوهش و ارائه

نام استاد : جناب آقای پیمان کبیری

نام دانشجو : پریسا ظفری

شماره دانشجویی : 97400114

موضوع پژوهش :

تشخیص هویت افراد با عنبیه در هوش مصنوعی

(Identification of people with iris in artificial intelligence)

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لینک های مورد استفاده

علت انتخاب موضوع

با توجه به پیشرفت روزافزون انسان در حیطه رایانه و هوش مصنوعی و تاکید بر دانش های امنیتی موضوع تشخیص هویت انسان ها از روی عنبیه چشم را انتخاب کردم و با بررسی مقالات مختلف و میزان بازدید از این مقالات به بررسی این موضوع می پردازیم.

تاریخچه موضوع

در دهه ی 1980 دو چشم پزشک برای اولین بار مسئله ی منحصر به فرد بودن عنبیه را در افراد و حتی در دوقلوهای همسان را مطرح کردند. این دو چشم پزشک براساس مشاهدات بالینی که ویژگی های عنبیه مانند رنگ، حفره ها، شکاف و دیگر ویژگی های عنبیه را بررسی کردند و به این نتیجه رسیدند. بنابراین عنبیه می تواند یک ویژگی بیومتریک منحصر به فرد برای شناسایی افراد باشد.

در سال 1990 دکتر دوماگن الگوریتمی برای پیاده سازی عنبیه ی چشم توسعه داد. در این الگوریتم از محاسبات ریاضی و شناسایی الگوی عنبیه ی چشم استفاده شده است.

امروزه نیاز به سیستم های کنترل دسترسی با دقت و سرعت بالا بر کسی پوشیده نیست. فناوری بیومتریک روش مناسبی برای شناسایی و تعیین هویت افراد هستند. عنبیه چشم نیز به دلیل منحصر به فرد بودن آن در تمامی افراد، می تواند گزینه ی مناسبی برای تشخیص هویت باشد. هم اکنون از تشخیص هویت بر اساس عنبیه در مکان های مختلفی مانند فرودگاه ها، دستگاه های خودپرداز، کنترل دسترسی به تجهیزات فیزیکی و امنیت اطلاعات استفاده می شود.

چکیده مطالب

تشخیص عنبیه چشم در مقایسه با بسیاری از ویژگی های بیومتریکی دیگر، از میزان صحت تشخیص بسیار بالایی برخوردار است. دقت تشخیص یک سیستم احراز هویت بیومتریکی، اغلب به دلیل نقص های محیطی، فیزیولوژیکی و سبک کاربری، بسیار کاهش می یابد. از این رو یک روش بیومتریکی چند کیفیتی به منظور تایید هویت، به استفاده از دو ویژگی شایسته به نام های عنبیه و شبکیه چشم پیشنهاد شده است. این رویکرد چند کیفیتی اشکالات سیستم های تکی بیومتریکی را کاهش می دهد و کارایی یک سیستم احراز هویت را بهبود می بخشد. شناسایی بیومتریکی عنبیه و شبکیه چشم، یک راه حل بسیار قابل اعتماد برای احراز هویت فردی ارایه می دهد. سیستم تشخیص عنبیه متشکل از قطعه بندی، نرمال سازی و رمزگذاری ویژگی ها و مطابقت آن ها می باشد. به جای استفاده از کل کد مربوط به عنبیه، فقط بیت هایی که سازگار با کد عنبیه هستند و بهترین بیت های معروف هستند، در فرآیند تطبیق ویژگی ها در نظر گرفته شده اند این زمان محاسباتی و ذخیره سازی مورد نیاز کد مربوط به عنبیه را کاهش می دهد. به منظور افزایش عملکرد شناسایی، فرآیند تشخیص عنبیه صورت جداگانه بر روی عنبیه راست و چپ اعمال می شود و نمرات فاصله متناظر، برای هر کدام از عنبیه های یک فرد تولید می شوند. این نمرات با استفاده از قانون ادغام وزن کل که نرخ شناسایی را افزایش می دهد، ترکیب می شوند. به منظور ایجاد قابلیت تایید و لحظه برای سیستم احراز هویت مان، ما نیز الگوشناسی و رگ های خونی شبکیه را به کار گرفته ایم. سپس نمرات به دست آمده از شناسایی شبکیه و عنبیه، با استفاده از قانون ادغام وزن کل ترکیب می شوند. که نرخ شناسایی را بسیار بالا می برند.



Yoshua Bengio

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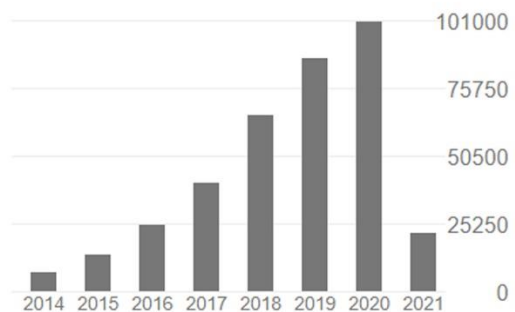
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Neural Function Modules with Sparse Arguments: A Dynamic Approach to Integrating Information across Layers

2021

A Lamb, A Goyal, A Slowik, M Mozer, P Beaudoin, Y Bengio

International Conference on Artificial Intelligence and Statistics, 919-927

Using Artificial Intelligence to Visualize the Impacts of Climate Change

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A Luccioni, V Schmidt, V Vardanyan, Y Bengio

IEEE Computer Graphics and Applications 41 (1), 8-14



Neural Function Modules with Sparse Arguments: A Dynamic Approach to Integrating Information across Layers [\[PDF\] from mlr.press](#)

Authors	Alex Lamb, Anirudh Goyal, Agnieszka Słowik, Michael Mozer, Philippe Beaudoin, Yoshua Bengio
Publication date	2021/3/18
Conference	International Conference on Artificial Intelligence and Statistics
Pages	919-927
Publisher	PMLR
Description	Feed-forward neural networks consist of a sequence of layers, in which each layer performs some processing on the information from the previous layer. A downside to this approach is that each layer (or module, as multiple modules can operate in parallel) is tasked with processing the entire hidden state, rather than a particular part of the state which is most relevant for that module. Methods which only operate on a small number of input variables are an essential part of most programming languages, and they allow for improved modularity and code re-usability. Our proposed method, Neural Function Modules (NFM), aims to introduce the same structural capability into deep learning. Most of the work in the context of feed-forward networks combining top-down and bottom-up feedback is limited to classification problems. The key contribution of our work is to combine attention, sparsity, top-down and bottom-up feedback, in a flexible algorithm which, as we show, improves the results in standard classification, out-of-domain generalization, generative modeling, and learning representations in the context of reinforcement learning.
Scholar articles	Neural Function Modules with Sparse Arguments: A Dynamic Approach to Integrating Information across Layers A Lamb, A Goyal, A Słowik, M Mozer, P Beaudoin... - International Conference on Artificial Intelligence and ..., 2021 Related articles All 3 versions



Using Artificial Intelligence to Visualize the Impacts of Climate Change [\[PDF\] from researchgate.net](#)

Authors	Alexandra Luccioni, Victor Schmidt, Vahe Vardanyan, Yoshua Bengio
Publication date	2021/1/14
Journal	IEEE Computer Graphics and Applications
Volume	41
Issue	1
Pages	8-14
Publisher	IEEE
Description	Public awareness and concern about climate change often do not match the magnitude of its threat to humans and our environment. One reason for this disagreement is that it is difficult to mentally simulate the effects of a process as complex as climate change and to have a concrete representation of the impact that our individual actions will have on our own future, especially if the consequences are long term and abstract. To overcome these challenges, we propose to use cutting-edge artificial intelligence (AI) approaches to develop an interactive personalized visualization tool, the AI climate impact visualizer. It will allow a user to enter an address—be it their house, their school, or their workplace—and it will provide them with an AI-imagined possible visualization of the future of this location in 2050 following the detrimental effects of climate change such as floods, storms, and wildfires. This image will be ...
Scholar articles	Using Artificial Intelligence to Visualize the Impacts of Climate Change A Luccioni, V Schmidt, V Vardanyan, Y Bengio - IEEE Computer Graphics and Applications, 2021 Related articles All 3 versions



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Professor Emeritus, EECS, [UC Berkeley](#)

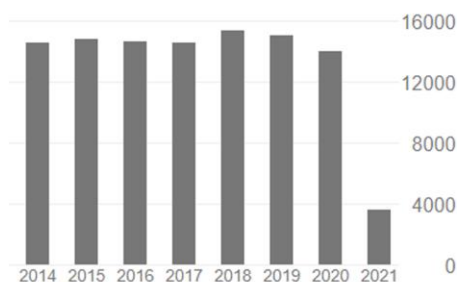
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System and Method for Extremely Efficient Image and Pattern Recognition and Artificial Intelligence Platform

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LA Zadeh, S Tadayon, B Tadayon
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System and Method for Extremely Efficient Image and Pattern Recognition and Artificial Intelligence Platform

130

2018

LA Zadeh, S Tadayon, B Tadayon
US Patent App. 15/919,170

بررسی مقاله و تغییرات آن از سال ۲۰۱۸ تا ۲۰۲۰



System and Method for Extremely Efficient Image and Pattern Recognition and Artificial Intelligence Platform

Inventors Lotfi A Zadeh, Saied Tadayon, Bijan Tadayon

Publication date 2020/6/11

Patent office US

Application number 16729944

Description Specification covers new algorithms, methods, and systems for: Artificial Intelligence; the first application of General-AI.(versus Specific, Vertical, or Narrow-AI)(as humans can do)(which also includes Explainable-AI or XAI); addition of reasoning, inference, and cognitive layers/engines to learning module/engine/layer; soft computing; Information Principle; Stratification; Incremental Enlargement Principle; deep-level/detailed recognition, eg, image recognition (eg, for action, gesture, emotion, expression, biometrics, fingerprint, tilted or partial-face, OCR, relationship, position, pattern, and object); Big Data analytics; machine learning; crowd-sourcing; classification; clustering; SVM; similarity measures; Enhanced Boltzmann Machines; Enhanced Convolutional Neural Networks; optimization; search engine; ranking; semantic web; context analysis; question-answering system; soft, fuzzy, or un-sharp boundaries ...

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System and Method for Extremely Efficient Image and Pattern Recognition and Artificial Intelligence Platform

Inventors Lotfi A Zadeh, Saied Tadayon, Bijan Tadayon

Publication date 2018/7/19

Patent office US

Application number 15919170

Description Specification covers new algorithms, methods, and systems for: Artificial Intelligence; the first application of General-AI (versus Specific, Vertical, or Narrow-AI)(as humans can do); addition of reasoning, inference, and cognitive layers/engines to learning module/engine/layer; soft computing; Information Principle; Stratification; Incremental Enlargement Principle; deep-level/detailed recognition, eg, image recognition (eg, for action, gesture, emotion, expression, biometrics, fingerprint, tilted or partial-face, OCR, relationship, position, pattern, and object); Big Data analytics; machine learning; crowd-sourcing; classification; clustering; SVM; similarity measures; Enhanced Boltzmann Machines; Enhanced Convolutional Neural Networks; optimization; search engine; ranking; semantic web; context analysis; question-answering system; soft, fuzzy, or un-sharp boundaries/impresiseness/ambiguities/fuzziness in class or set ...

Total citations Cited by 130



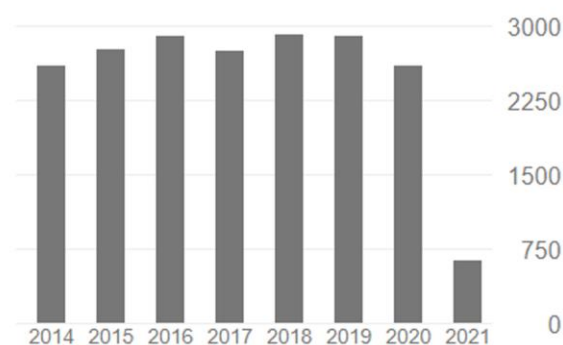
Scholar articles [System and Method for Extremely Efficient Image and Pattern Recognition and Artificial Intelligence Platform](#)
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AA Salah, A Ross

IEEE Transactions on Biometrics, Behavior, and Identity Science 3 (1), 4-5

Security in smart cities: A brief review of digital forensic schemes for biometric data

6

2020

A Ross, S Banerjee, A Chowdhury

Pattern Recognition Letters 138, 346-354

Iris+ ocular: Generalized iris presentation attack detection using multiple convolutional neural networks

10

2019

S Hoffman, R Sharma, A Ross

2019 International Conference on Biometrics (ICB), 1-8

Iris recognition with off-the-shelf CNN features: A deep learning perspective

155

2017

K Nguyen, C Fookes, A Ross, S Sridharan

IEEE Access 6, 18848-18855



Iris recognition with off-the-shelf CNN features: A deep learning perspective

[\[PDF\] from ieee.org](#)

Authors Kien Nguyen, Clinton Fookes, Arun Ross, Sridha Sridharan

Publication date 2017/12/18

Journal IEEE Access

Volume 6

Pages 18848-18855

Publisher IEEE

Description Iris recognition refers to the automated process of recognizing individuals based on their iris patterns. The seemingly stochastic nature of the iris stroma makes it a distinctive cue for biometric recognition. The textural nuances of an individual's iris pattern can be effectively extracted and encoded by projecting them onto Gabor wavelets and transforming the ensuing phasor response into a binary code - a technique pioneered by Daugman. This textural descriptor has been observed to be a robust feature descriptor with very low false match rates and low computational complexity. However, recent advancements in deep learning and computer vision indicate that generic descriptors extracted using convolutional neural networks (CNNs) are able to represent complex image characteristics. Given the superior performance of CNNs on the ImageNet large scale visual recognition challenge and a large number of other ...

Total citations [Cited by 155](#)



Selected Works From Automated Face and Gesture Recognition 2020

[\[PDF\] from ieee.org](#)

Authors Albert Ali Salah, Arun Ross

Publication date 2021/2/11

Journal IEEE Transactions on Biometrics, Behavior, and Identity Science

Volume 3

Issue 1

Pages 4-5

Publisher IEEE

Description The 15th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2020) was held online between 16 and 20 November 2020. The IEEE conference series on Automatic Face and Gesture Recognition is the premier international forum for research in image and video-based face, gesture, and body movement recognition. The program chairs of FG 2020 invited the authors of outstanding papers from over 75 accepted papers to submit extended versions of their work to a special issue of the IEEE TRANSACTIONS ON BIOMETRICS, BEHAVIOR AND IDENTITY SCIENCE, based on topical suitability, reviewer scores, and area chair comments. These submissions went through the normal peer-review process at TBIOM—including in some instances substantial further revision and improvement—leading to the set of three papers appearing in this issue.

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لینک های مورد استفاده

- S. Tarare, A. Anjekar, and H. Turkar, "Fingerprint Based Gender ...
- A. Albadarneh, I. Albadarneh, and J. Alqatawna, "Iris recognition system ...
- A. Paul, T. Z. Khan, P. Podder, R. Ahmed, M. ...
- V. Saravanan and R. Sindhuja, "Iris authentication through Gabor filter ...
- J. Wayman, A. Jain, D. Maltoni, and D. Maio, An ...
- _ P. Hendre, V. Parab, G. Kakade, and N. Kamble, ...
- A. C. Weaver, "Biometric authentication, " Computer, vol. 39, pp. ...
- R. Gupta and P. Sehgal, " A survey of attacks ...
- D. Bhattacharyya, R. Ranjan, F. Alisherov, and M. Choi, "Biometric ...
- R. H. Sheikh, M. M. Raghuwanshi, and A. N. Jaiswal, ...
- M. Srinivas and L M. Patnaik, "Genetic algorithms: a survey, ...
- B. M. Wilamowski, "Neural network architectures and learning algorithms, "
- [2]. Desoky, A. I., et al. (2012). "Enhancing iris recognition system performance using templates fusion." Ain Shams Engineering Journal 3(2): 133-140.
- [3]. Ross, A. and A. Jain (2003). "Information fusion in biometrics." Pattern recognition letters 24(13): 2115-2125.
- [4]. Daugman, J. G. (1993). "High confidence visual recognition of persons by a test of statistical independence." IEEE transactions on pattern analysis and machine intelligence 15(11): 1148-1161.
- [5]. Daugman, J. (2003). "The importance of being random: statistical principles of iris recognition." Pattern recognition 36(2): 279-291.
- [6]. Wildes, R. P. (1997). "Iris recognition: an emerging biometric technology." Proceedings of the IEEE 85(9): 1348-

1363.

[7]. Tisse, C.-I., et al. (2002). Person identification technique using human iris recognition. Proc. Vision Interface.

[8]. Ma, L., et al. (2003). "Personal identification based on iris texture analysis." IEEE transactions on pattern analysis and machine intelligence 25(12): 1519-1533.

[9]. Kong, W. and D. Zhang (2001). Accurate iris segmentation based on novel reflection and eyelash detection model.

Intelligent Multimedia, Video and Speech Processing, 2001. Proceedings of 2001 International Symposium on, IEEE.

[10]. Heyer, R. (2008). "Biometrics Technology Review 2008."

[11]. Latha, L. and S. Thangasamy (2010). "A robust person authentication system based on score level fusion of left and right irises and retinal features." Procedia Computer Science 2: 111-120.

[12]. Maio, D., et al. (2003). Handbook of fingerprint recognition, Springer Verlag.

[13]. Hannibal, M. and L. Mountford (2002). The law of criminal and civil evidence: principles and practice, Pearson Education.

[14]. Liu, S. and M. Silverman (2001). "A practical guide to biometric security technology." IT Professional 3(1): 27-

[15]. Sims, D. (1994). "Biometric recognition: our hands, eyes, and faces give us away." IEEE Computer graphics and Applications 14(5): 14-15.

[16]. Shu, W. and D. Zhang (1998). "Automated personal identification by palmprint." Optical Engineering 37(8):

[17]. Zhang, D., et al. (2003). "Online palmprint identification." IEEE transactions on pattern analysis and machine

intelligence 25(9): 1041-1050.

[18]. Shu, W. and D. Zhang (1998). Palmprint verification: an implementation of biometric technology. Pattern Recognition, 1998. Proceedings. Fourteenth International Conference on, IEEE.

[19]. Desoky, A. I., et al. (2012). "Enhancing iris recognition system performance using templates fusion." Ain Shams Engineering Journal 3(2): 133-140.

[20]. Wildes, R. P., et al. (1994). A system for automated iris recognition. Applications of Computer Vision, 1994., Proceedings of the Second IEEE Workshop on, IEEE.

[21]. Daugman, J. (2004). "How iris recognition works." IEEE Transactions on circuits and systems for video technology 14(1): 21-30.

[22]. Yao, P., et al. (2006). Iris recognition algorithm using modified log-gabor filters. 18th International Conference on Pattern Recognition (ICPR'06), IEEE.

[23]. Boles, W. W. and B. Boashash (1998). "A human identification technique using images of the iris and wavelet transform." IEEE transactions on signal processing 46(4): 1185-1188.

[24]. Daugman, J. G. (1994). Biometric personal identification system based on iris analysis, Google Patents.

[25]. Zhu, Y., et al. (2000). Biometric personal identification based on iris patterns. International Conference on Pattern Recognition.

[26]. Zhang, Y., et al. (2009). "Detection of retinal blood vessels based on nonlinear projections." Journal of Signal Processing Systems 55(1-3): 103-112.

[27]. Chambolle, A. (2004). "An algorithm for total variation minimization and applications." Journal of Mathematical

imaging and vision 20(1-2): 89-97.

[28]. Aujol, J.-F., et al. (2006). "Structure-texture image decomposition—modeling, algorithms, and parameter

selection." International Journal of Computer Vision 67(1): 111-136.

[29]. Gonzalez, R. C., et al. (2004). "Digital image using Matlab processing." Person Prentice Hall, Lexington

https://scholar.google.com/citations?hl=en&view_op=search_authors&mauthors=label%3Airis_recognition&btnG=

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