

TOPIC OF RESEARCH

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INTRODUCTION

- I am a pedagogical employee at the Faculty of Electrical Engineering and Information Technology STU in Bratislava
- research and teaching activities are focused on methods of artificial intelligence, especially on artificial neural networks and evolutionary algorithms and their applications in robotics, medicine and process control
- I deal mainly with applications of deep neural networks in the area of image recognition, classification and detection.
- I am the author of more than 100 publications, mainly in the field of artificial intelligence and process control, co-researcher of several projects VEGA, KEGA and APVV.
- Doctoral study in the field of study automation at the Department of Automated Control Systems FEI STU (1998-2001), dissertation on the topic "Modeling and control of nonlinear systems by artificial neural networks with orthogonal activation functions" defended in 2006.
- University studies at the Faculty of Electrical Engineering and Informatics in Bratislava, section of automatization

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Diabetic retinopathy

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- PAVLOVIČOVÁ, Jarmila - KAJAN, Slavomír - MARKO, Martin - ORAVEC, Miloš - KURILOVÁ, Veronika. Bright lesions detection on retinal images by convolutional neural network. In *Proceedings ELMAR-2018 : 60th International symposium. Zadar, Croatia. 2018*. pp. 79-82. ISBN 978-953-184-244-0.
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Hand gesture recognition

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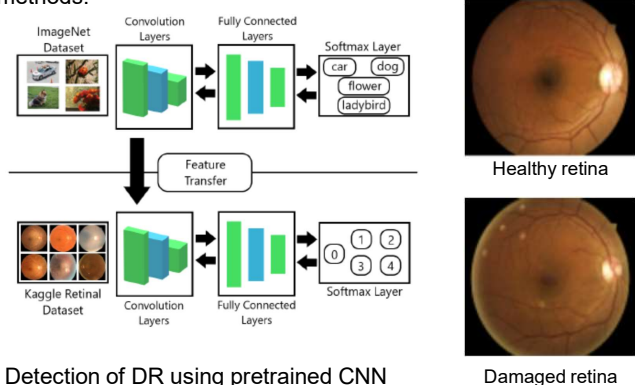
RESEARCH

DIABETIC RETINOPATHY DETECTION

- Diabetic retinopathy (DR) is an accompanying vision disorder caused by diabetes. Upon early detection of diabetic retinopathy, the course of eye damage may be slowed down or even stopped surgically. Diagnosis of diabetic retinopathy - preventive screening program. The need to automate the evaluation of the retina image for DR.

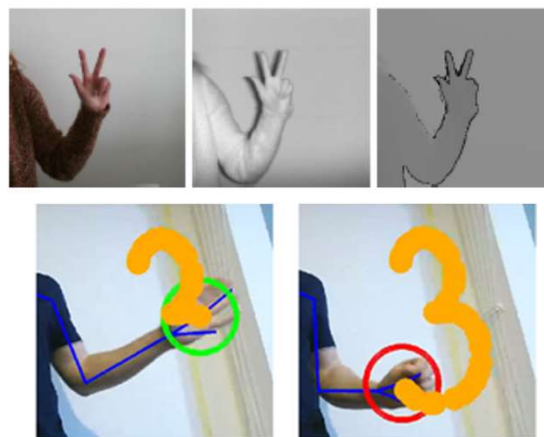
Two main approaches of DR:

- Detection of symptoms (features) in the retina image. Search for feature regions (soft and hard exudates, microaneurysms, hemorrhage).
- Classification of retina images into groups according to the degree of disease. Our approach uses convolutional neural networks (CNN) and detectors based on deep learning methods.



HAND GESTURES RECOGNITION

- Research dealing with the recognition of static and dynamic hand gestures
- Convolutional neural networks are used for recognition, (other methods Dynamic time warping, Hidden Markov Models, LSTM network)
- Using Kinect v2 and Leap Motion sensors, a static ASL character gesture dataset was created (65 people, color, infra, depth images)
- A Kinect v2 sensor dataset (5 people) was created for dynamic handwriting gestures containing the digits 0 to 9



Examples of static a dynamic gestures from datasets