Phase Transform For Object And Shape Detection In Digital Images

Tech ID: 29786 / UC Case 2014-840-0

SUMMARY

UCLA researchers in the Department of Electrical and Computer Engineering have developed a new edge algorithm to recognize objects and texture in digital images. The new algorithm outperform the state-of-the-art methods in visually impaired images.

BACKGROUND

Exponential growth in the amount of digital data generated by sensors and computers has caused great difficulty in analyzing the huge amount of the flooding data. In the past decades, many computer vision methods such as edge detection, object recognition, and machine learning algorithms have been developed for Big Data handling. The Canny edge detector is considered as a state-of-the-art however still can be further improved, especially under adverse image situations and conditions.

INNOVATION

UCLA researchers proposed and demonstrated a new edge detection method where the image under analysis is passed through a phase transformation and the output phase image is post-processed to generate the edges and textures. The so-called Phase Stretch Transformation (PST) can be done by operating either in frequency domain or spatial domains.

APPLICATIONS

Classification of object and texture in digital images.

ADVANTAGES

- Enhanced edge detection abilities and simplicity over state-of-the-art Canny's method in low intensity and low contrast images
- Fast numerical implementation (not iterative)

STATE OF DEVELOPMENT

The UCLA researchers have validated the new algorithm by demonstrating its utility in numerous example images including natural images and medical images.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,275,891	04/30/2019	2014-840

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Apparatus And Method For Optically Amplified Multi-Dimensional Spectrally Encoded Imaging
- Apparatus And Method For Multiple-Pulse Impulsive Stimulated Raman Spectroscopy
- Ultrafast Differential Interference Contrast Microscopy
- Global Training Of Neural Networks For Phenomic Classification
- A Single-Shot Network Analysis Method For The Characterization Of Opto-Electronic And Electrical Devices And Systems
- Apparatus and Signal Processing Technique for Real-Time Label-Free High-Throughput Cell Screening

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OTHER INFORMATION

KEYWORDS

Edge detection, phase transformation, frequency domain, spatial domain

CATEGORIZED AS

- **Computer**
  - Software

RELATED CASES

2014-840-0

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