

# Measuring Scour Level using Image Processing

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# ABSTRACT

- ▶ Scour monitoring is a process to measure the level of soil erosion at the bridge pillars. Currently, the monitoring and the interpretation is done manually. This work proposes an automatic scour monitoring system that is able to detect and measure the level of scour. The system uses image processing techniques such as image inpainting, Hough transform to detect the level of scour, and artificial neural network to measure the scour level and scale numbers. Results show that the scour level can be detected automatically for even and uneven soil, and the scour level can be measured automatically and accurately.

# INTRODUCTION

- ▶ Scouring process is the process of degradation of bed level, which is caused by water flow and strong wind. This process occurs naturally but also can be caused by human activities such as deforestation.
- ▶ The problem can become more severe when they are typhoons and flood due to heavy rainfall. Scour is the dynamic process that changes according to the depth of the river, angle of water flow, pole design, material particles and other factors [3]. Scour is a major problem worldwide. For example, in the United State, approximately 60% of the bridge failures is due to scour issue.

# EXISTING SYSTEM

- ▶ Scouring process is the process of degradation of bed level, which is caused by water flow and strong wind. This process occurs naturally but also can be caused by human activities such as deforestation.
- ▶ The problem can become more severe when they are typhoons and flood due to heavy rainfall. Scour is the dynamic process that changes according to the depth of the river, angle of water flow, pole design, material particles and other factors [3]. Scour is a major problem worldwide.

# PROPOSED SYSTEM

- ▶ This work proposes an automatic scour monitoring system that is able to detect and measure the level of scour. The system uses image processing techniques such as image in painting,
- ▶ Hough transform to detect the level of scour, and artificial neural network to measure the scour level and scale numbers. Results show that the scour level can be detected automatically for even and uneven soil, and the scour level can be measured automatically and accurately.

# HARDWARE REQUIREMENTS

- ▶ Processor :Intel Pentium IV 1GHz
- ▶ RAM :256MB (Min)
- ▶ Hard Drive :5GB free space
- ▶ Monitor :1024 \* 768, High Color inch
- ▶ Mouse :Scroll Mouse(Logitech)
- ▶ Keyboard :104 keys

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# SOFTWARE REQUIREMENTS

- OS : Windows XP/7/8
- ▶ Front End : Visual Studio 2010/netbeans 7.1
- ▶ Back End : SQL Server 2005/heidisql
- ▶ Browser : Any Web Browser

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# conclusion

- ▶ A computerized scour monitoring system based on image processing techniques was developed. The scour that has variation in structure and steepness can be measured using the proposed technique. Results of this work show that the level of scour can be measured automatically with higher accuracy than that of conventional approach. The scale numbers and the scale levels can also be detected. In the future work, the evolution of the levels of sediment will be measured and monitored in time-series.

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# REFERENCES

- [1] F. Azhari and K.J. Loh, “Laboratory validation of buried piezoelectric scour sensing rods”, Structural Control Health Monitoring, vol. 24(9), September 2017.
- [2] B.W. Melville and S.E. Coleman, Bridge Scour, Water Resources Publications, January 2000.
- [3] P.E. Clopper, P.F. Lagasse and L.W. Zevenbergen, “Bridge pier scour countermeasures”, World Environmental and Water Resources Congress, May 2007.
- [4] X. Kong, S.C.M. Ho, G. Song, and C.S. Cai, “Scour monitoring system using fiber Bragg grating sensors and water-swelling polymers”, Journal of Bridge Engineering, vol. 22(7), July 2017.
- [5] M.C. Forde, D.M. McCann, M.R. Clark, K.J. Broughton, P.J. Fenning, and A. Brown, “Radar measurement of bridge scour”, NDT&E International, vol. 32(8), pp. 481-492, 1999.

# CONTD..

- [6] J. Rao, J. Lin, S. Xu, and S. J. Lin, "A new intelligent contour tracking algorithm in binary image," in Proc. 4th International Conference on Digital Home, 2012, pp 18-22.
- [7] G. Pradeep, B. S. Chandra and M. Venkateswarao, "AdHoc Low Powered 802.15.1 Protocol Based Automation System for Residence using Mobile Devices", IJCST Vol.1. 2, No.1, pp.93-96, December 2011.
- [8] Live streaming DIY system [Online] Available <http://www.networkworld.com/article/2925722/security0/homesecurity-demystified-how-to-build-a-smart-diy-system.html>
- [9] Angela Antony, Prof. G. R. Gidveer, "Live Streaming Motion Detection Camera Security System with Email Notification using Raspberry Pi" IOSR Journal of Electronics and Communication Engineering (IOSRJECE), Special Issue - AETM'16, pp.142-147.