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DECLARATION OF GORDON MACPHERSON

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A.	Wei Liu et al.; "Subband adaptive generalized sidelobe canceller for broadband beamforming", Proceedings of the 11th IEEE Signal Processing Workshop on Statistical Signal Processing, August 8, 2001.

9. I obtained a copy of Exhibit A through IEEE Xplore, where it is maintained in the ordinary course of IEEE's business. Exhibit A is a true and correct copy of the Exhibit, as it existed on or about December 29, 2021.

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11. Wei Liu et al.; "Subband adaptive generalized sidelobe canceller for broadband beamforming" was published in the Proceedings of the 11th IEEE Signal Processing Workshop on Statistical Signal Processing. The 11th IEEE Signal Processing Workshop on Statistical Signal Processing was held on August 8, 2001. Copies of the conference proceedings were made available no later than the day of the conference. The article is currently available for public download from the IEEE digital library, IEEE Xplore.

12. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

I declare under penalty of perjury that the foregoing statements are true and correct.

Executed on: 1/6/2022

DocuSigned by:
Gordon MacPherson
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EXHIBIT A

Subband adaptive generalized sidelobe canceller for broadband beamforming

Publisher: IEEE

Wei Liu ; S. Weiss ; L. Hanzo All Authors

Abstract

Abstract: We propose a novel subband adaptive broadband beamforming architecture based on the generalised sidelobe canceller (GSC), in which we decompose each of the tapped delay-l... **View more**

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Abstract:

We propose a novel subband adaptive broadband beamforming architecture based on the generalised sidelobe canceller (GSC), in which we decompose each of the tapped delay-line signals feeding the adaptive part of the GSC and the reference signal into subbands and perform adaptive minimisation of the mean squared error in each subband independently. Besides its lower computational complexity, this new subband adaptive GSC outperforms its fullband counterpart in terms of convergence speed because of its prewhitening effect. Simulations based on different kinds of blocking matrices with different orders of derivative constraints are presented to support these findings.

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Published in: Proceedings of the 11th IEEE Signal Processing Workshop on Statistical Signal Processing (Cat. No.01TH8563)

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Contents

1. INTRODUCTION

Adaptive beamforming has found many applications in various areas ranging from sonar and radar to wireless communications. It is based on a technique where, by adjusting the weights of a sensor array with attached filters, a prescribed spatial and spectral selectivity is achieved. Fig. 1 shows a beamformer with sensors receiving a signal of interest from the direction of arrival (DOA) angle . Fig. 1: A signal impinging from an angle onto a beamformer with sensors.

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