NOTICE OF RESEARCH PROJECT

SCIENCE INFORMATION EXCHANGE

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NATIONAL SCIENCE FOUNDATION

PROJECT SUMMARY

SIE PROJECT NO.
NSF AWARD NO.

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DIRECTORATE/DIVISION	PROGRAM OR SECTION	PROPOSAL NO.	F.Y.

NAME OF INSTITUTION (INCLUDE BRANCH/CAMPUS AND SCHOOL OR DIVISION)

Stanford University

1988?

ADDRESS (INCLUDE DEPARTMENT)

Center for Computer Research in Music and Acoustics
Department of Music
Stanford University
Stanford, CA 94305

PRINCIPAL INVESTIGATOR(S)

Dr. John Chowning, P.I., Dr. Bernard Mont-Reynaud, Associate Investigator

TITLE OF PROJECT

Intelligent Analysis of Composite Acoustic Signals

TECHNICAL ABSTRACT (LIMIT TO 22 PICA OR 18 ELITE TYPEWRITTEN LINES)

This research is concerned with machine perception of complex sound signals. The goal is to reliably identify and track simultaneous acoustic sources in a monaural signal.

In the proposed architecture, perception results from the interaction of data-driven and expectation-driven agents. The allocation of resources to system agents, and the control of feedback loops between different levels of interpretation of the time-varying signal are approached with strategies that simulate real-time problemsolving.

At the lowest level of analysis, multirate signal processing, used in conjunction with focus-switching heuristics, ought to yield high resolution simultaneously in time and frequency, thus giving an efficient method for improving upon traditional bandwidth-time tradeoffs.

Source coherence criteria derived from psychoacoustic work on auditory streaming (including correlated AM and FM modulation among partials) are expected to be useful for separating sources when more familiar methods do not suffice.

The proposed system relies on a learning co-processor to attune itself to increasingly elusive aspects of a signal. Relevant techniques include traditional parameter adaptation, numerical taxonomy, syntactic pattern matching and concept learning. Especially important is the development of hybrid methods that combine parametric and structural views.

In summary, the research addresses key areas of acoustic analysis as well as broader issues in the architecture of AI systems.

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