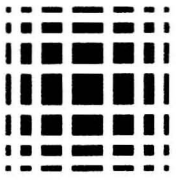

College of Engineering
University of Washington

Introduction to Artificial Neural Systems

- Two day course on the rapidly developing technology of artificial neural networks
- For those interested in emerging signal processing and pattern recognition algorithms and architectures, and for those involved in charting new industrial directions
- You will learn about the neurological basis for artificial neural networks, current and potential applications, and implementation of neural networks in various technologies.

August 20–21, 1987
Seattle, Washington

Introduction to Artificial Neural Systems

August 20–21, 1987 University of Washington, Seattle

Course Contents

Technical

- Biological foundation of neural networks
- Neural network associative memories
- Signal space interpretations
- Fault tolerance in neural networks
- Synchronous vs. asynchronous operation
- Hierarchical neural networks
- Network design based on energy reduction
- Boltzman (learning) machines
- Error back propogation
- Hebbian learning
- Signal classification networks
- Pattern extrapolation
- Image reconstruction
- Hierarchical neural networks
- Performance comparisons
- Silicon implementation of neural networks
- Optical implementation of neural networks
- Neural network storage capacity
- Search algorithms

Industrial

- The impact of neural networks on:
  —future technology
  —academic and government research
  —industry
- Other current research in neural networks including a bibliography of recent artificial neural network publications

Simulations

- Hands-on graphical neural net simulations
- Each participant will be given a neural network simulation program package

Who Should Attend

This short course is appropriate for engineers, computer scientists, and technical managers who would like to understand the theory of artificial neural systems and are interested in applying this technology to real world problems.

General Information

Researchers in signal processing have long been intrigued by the computational and fault tolerant properties of the brain. There has recently been a surge of interest in processing architectures based on such biological neural networks. Such networks consist of a large number of intensely interconnected elementary processors. Artificial neural networks have been implemented successfully both electronically and optically.

Participants in this course will be presented the most relevant modern artificial neural network theory. The neural net will be examined as an associative memory architecture. Other topics to be presented include programmability (e.g. learning), storage capacity and fault tolerance.

Applications include signal classification, image processing and speech recognition. Electronic, optical and hybrid implementations of the neural network will be discussed. There will be in-class computer simulations of the neural network. Participants will be given a personal copy of a neural network simulation software package.

Location

The course will be held at the University of Washington's Waterfront Activities Center, a pleasant retreat located on Union Bay. No on-campus housing is available; however, a list of hotels and motels within walking distance of the campus will be sent upon request (see registration form).

Registration Information

The registration fee for this course is $425.00 if received before August 12 and $445.00 after that date. It includes all course materials and one floppy disk, lunch each day, refreshment breaks and parking on campus. Full refund will be given up to five working days prior to the start of the course. After that, a $25.00 handling fee will be deducted from your refund.

Course Registration Form

Introduction to Artificial Neural Systems
August 20–21, 1987

before August 12 **425.00**
after August 12 **445.00**

Please enroll me for this course:

Name_____ Position_____

Company/Agency_____ Phone_____

Company Address_____

City_____ State_____ ZIP_____

____Check enclosed payable to the University of Washington.

____Purchase order attached; please invoice my company.

____Bill my (circle one): VISA MASTERCARD

Acct. #_____ Expiration Date_____

Signature on card_____

____Please send me a list of local lodging facilities.

____Please enclose a campus parking permit (not necessary for government vehicles).

Mail form to: Engineering Continuing Education, 4725 30th Ave. NE, University of Washington, GG-13, Seattle, WA 98195. For questions, please call **(206) 543-5539.**

Introduction to Artificial Neural Systems

August 20–21, 1987

Sponsored by College of Engineering University of Washington, Seattle

Instructors

Les E. Atlas is an Assistant Professor of Electrical Engineering at the University of Washington. His research interests include speech processing, auditory system processing and real time signal processor design. Dr. Atlas was recently involved in the restoration of voice transmissions from Korean Air flight 007. His work in neural networks is supported by a National Science Foundation Presidential Young Investigator's Award and, more recently, by the Boeing High Technology Center.

Robert J. Marks II is a Professor of Electrical Engineering at the University of Washington. He has published over fifty archival journal papers in the areas of optical computing, detection theory, signal analysis and processing, and neural computing. Dr. Marks is a Senior Member of IEEE and, in 1984, was awarded IEEE's Centennial Medal. He is currently Chair of the Neural Systems and Applications Technical Committee for the IEEE Circuits and Systems Society. His research in neural networks is supported in part by a grant from the SDI/IST's program in ultra-high speed computing and by the Boeing High Technology Center.

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