

University of St Andrews
Department of Mathematical and Computational Sciences

Computer Science Division

**Annual Open Lecture Course
1994**

Fault-Tolerant Distributed Systems

Thursday 21st and Friday 22nd April 1994

Speakers:

Professor Ozalp Babaoglu
University of Bologna

Professor Santosh Shrivastava
University of Newcastle upon Tyne

The Speakers

Santosh Shrivastava obtained his PhD in Computer Science from Cambridge in 1975. After several years in industry, he joined the Computing Science Department of the University of Newcastle in 1975 where his present position is Professor of Computing Science. He is currently leading Arjuna and Voltan research groups. The Arjuna group has developed the Arjuna object-oriented fault-tolerant distributed system which supports atomic transactions on persistent objects. Arjuna is forming the basis for further research on flexible transaction processing in large scale distributed systems. He directs ESPRIT Basic Research project BROADCAST on large scale distributed systems. The Voltan group is undertaking research into high integrity real-time systems, which involves investigation of agreement protocols, failure detection and reconfiguration, communication primitives, clock synchronization and real-time scheduling. Some of these ideas have been incorporated in Voltan "fail-controlled" nodes. He has over 50 publications in the areas of fault-tolerance and distributed computing.

Ozalp Babaoglu received his PhD. in Computer Science from the University of California, Berkeley in 1981. Since 1988, he has been a Professor at the University of Bologna and a founding member of the Laboratory for Computer Science. Before moving to Italy, he was an Associate Professor of Computer Science at Cornell University, Ithaca, New York (USA) where he had been a faculty member since 1981. While at Berkeley, Professor Babaoglu was a principal designer and implementer of Berkeley UNIX for which he was awarded the 1982 Sakrison Memorial Award together with Bill Joy. He has been Principal Investigator on a number of research grants in the areas of distributed computing, fault tolerance and operating systems. He is conducting research on large-scale distributed systems for the ESPRIT basic research project BROADCAST. Professor Babaoglu has been chair and member of program committees for numerous conferences. He serves as an editor for the Springer-Verlag Distributed Computing journal and is a consultant to the CEC for Strategy in Distributed Systems. He is the author of over 40 scientific publications.

Registration

Coffee and Registration will be in the Physical Sciences/Computer Science Staff Common Room from 10.00 a.m. on 21st April.

Venue

All lectures will be held in Lecture Theatre C in the Department of Mathematical and Computational Sciences, University of St Andrews.

Fee

The fee for the course to academic visitors to the University will be £10. This covers the cost of any duplicated material that will be handed out and also morning and afternoon tea or coffee and biscuits. The fee to industrial visitors is £50. The lectures are informal but as we are limited to a total audience of 120, we would ask you to inform us of your intention to attend together with your fee in advance.

Accommodation

No special arrangements are being made for accommodation or meals but a list of hotels and bed and breakfast accommodation can be obtained from the Secretary, Computer Science Division, North Haugh, St Andrews, Fife KY16 9SS (Tel: 0334 63253; e-mail: helen@dcs.st-and.ac.uk).

Timetable

Thursday, April 21st

- 10.00-10.30 *Registration & Coffee*
- 10.30-11.20 Consistent global states of distributed systems:
fundamental concepts and mechanisms - I
Professor Babaoglu
- 11.20-12.10 Structuring fault-tolerant persistent object systems for
modularity
Professor Shrivastava
- 12.10-13.00 Consistent global states of distributed systems:
fundamental concepts and mechanisms - II Professor
Babaoglu
- 13.00-14.10 *Lunch*
- 14.10-15.00 Design and implementation of Arjuna distributed
programming system
Professor Shrivastava
- 15.00-15.50 Fault-tolerant broadcasts and related problems - I
Professor Babaoglu
- 15.50-16.10 *Tea*
- 16.10-17.00 An application of Arjuna
Professor Shrivastava

Friday, April 22nd

- 09.00-9.50 Fault-tolerant broadcasts and related problems - II Professor
Babaoglu
- 09.50-10.40 Replication management using the state-machine approach
Professor Babaoglu
- 10.40-11.00 *Coffee*
- 11.00-11.50 Active replication of non-deterministic programs Professor
Shrivastava
- 11.50-12.40 The primary-backup approach
Professor Babaoglu
- 12.40-14.00 *Lunch*
- 14.00-14.50 Object replication in Arjuna
Professor Shrivastava
- 14.50-15.40 Implementing fail-silent nodes for distributed systems
Professor Shrivastava

*Please note that the lectures start at **09.00** on the Friday*