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1995
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UNIVERSIDAD DE BUENOS AIRES
FACULTAD DE CIENCIAS EXACTAS Y NATURALES

1. DEPARTAMENTO: Computación
2. CUATRIMESTRE: Primero de 1995.
3. ASIGNATURA: **ALGORITMOS PARALELOS Y ARQUITECTURAS**
4. CARRERA: Licenciatura en Ciencias de la Computación
5. CARACTER DE LA MATERIA: Optativa.
6. NUMERO DE CODIGO DE CARRERA: 18
7. NUMERO DE CODIGO DE MATERIA: 597.
8. PUNTAJE: 2 plan '93 y plan '87, 3 puntos.
9. PLAN DE ESTUDIOS AÑO: 1993 y 1987.
10. DURACION DE LA MATERIA: Cuatrimestral
11. HORAS DE CLASE SEMANAL:
 - a) TEORICAS 2 HS.
 - b) LABORATORIO 3 HS.
 - c) PROBLEMAS
 - d) SEMINARIOS
12. CARGA HORARIA TOTAL: 5 HORAS
13. ASIGNATURAS CORRELATIVAS: Sistemas operativos y algoritmos y estructura de datos III (plan '93).
Matemática discreta y arquitectura y sistemas operativos (plan '87).
14. FORMA DE EVALUACION: Examen Final
15. PROGRAMA Y BIBLIOGRAFIA: Adjuntas a esta hoja

FECHA: 1/7/95

G.P

Firma del Profesor

Rx

Firma del Director

Lic. GUSTAVO PIFARRE

Aclaración de la Firma

Lic. ROBERTO BEVILACQUA
DIRECTOR ADJUNTO INTERINO
DEPARTAMENTO DE COMPUTACION

Sello Aclaratorio

ANEXO POR RESOLUCION CD 458/95

Propuesta para Materia Optativa del Departamento de Computación:

Algoritmos Paralelos y Arquitecturas

La presente propuesta de curso esta basado en el libro *Introduction to Parallel Algorithms and Architectures: Arrays, Trees and Hypercubes* de F. Thomson Leighton.

Resumen: El curso esta basado en el estudio de las principales redes de interconexión para maquinas paralelas y el estudio de algoritmos sobre ellas. Serán consideradas las topología mas populares: arrays, arboles, hipercubos, Cube Connected Cycles, Shuffle Exchange, etc.

Programa:

Arrays y Arboles: Sorting y Cuenta. Aritmética Entera. Algoritmos de Matrices. Algoritmos en Grafos. Algoritmos para el ruteo de paquetes. Arrays de muchas dimensiones.

Hipercubos y redes relacionadas: El hipercubo. La butterfly, Cube-Connected-Cycles y Benes Network. Los grafos Shuffle-Exchange y de Brijin. Algoritmos para el ruteo de paquetes. Sorting. Simulación de una Parallel Random Access Machine. Otras redes de tipo hipercubo.

Carga Horaria

Teórica 3 horas. Lunes 19 a 22.

Practica 3 horas. Miércoles 19 a 22.

Bibliografía:

- Parallel Algorithms and Architectures: Arrays, Trees and Hypercubes. Leighton. Morgan Kaufmann.
- Staged Circuit Switching. Arango, Badr and Gelenter. IEEE Transactions on Computers. 1985, February, 174--180, c-34 .
- Optimum Broadcasting and Personalized Communication in Hypercubes, Johnsson and Ho, IEEE Transactions on Computers, 1989, September, 1249--1268, c-38(9).

- An Adaptive Communications Protocol for Network Computer. Badr, Gelenter and Podar. Performance Evaluation. 1986. March. 35--51. Vol. 6.
- A Performance Comparison of Routing Algorithms for Hierarchical Hypercube Multicomputer Networks. Dandamundi. Proc. 1990 Int. Conf. Parallel Processing. 1990. August. 281--285.
- The Turn Model for Adaptive Routing. Glass and Ni. Proc. of the 19th Annual International Symposium on Computer Architecture. 1992. May. 278--287.
- Performance Analysis of Multiprocessor Mesh Interconnecton Networks with Wormhole Routing. Adve and Vernon. 1992. June.
- Fully-Adaptive Minimal Deadlock-Free Packet Routing in Hypercubes, Meshes, and Other Ntworks: Algorithms and Simulations. Pifarré, Gravano, Felperin and Sanz. IEEE Transaction on Parallel and Distributed Systems. 1994. March. 247--263. 5.
- Adaptive Deadlock- and Livelock-Free Routing in the Hypercube Network. Denicolay, Gravano, Pifarré and Sanz. IEEE Transaction on Parallel and Distributed Systems.
- Adaptive Deadlock- and Livelock-Free Routing With All Minimal Paths in Torus Network. Berman, Gravano, Pifarré and Sanz. IEEE Transaction on Parallel and Distributed Systems
- Mesh and torus chaotic routing. Bolding and Snyder. MIT/Brown Advanced Research in VLSI and Parallel Systems Conference.
- A theory of wormhole routing in parallel computers. Raghavan and Upfal. IBM Research.
- A survey of routing techniques in wormhole networks. Ni and McKinley. Department of Computer Science, Michigan State University.
- Universal Schemes for Parallel Communication. Valiant and Brebner. ACM STOC 1981.
- Routing Techniques for Massively Parallel Communication. Felperin, Gravano, Pifarré and Sanz.
- Proceedings of the IEEE , Special Issue on Massively Parallel Computers.
- Efficient Schemes for Parallel Communication. Upfal. JACM. 31. 3. 1984.
- General Purpose Parallel Architectures. Valiant. Handbook of T heoretical C omputer S cience.

- The Fluent Abstract Machine. Ranade, Bhat and Johnson. Fifth MIT conference on advanced research in VLSI. 1988.
- How to emulate shared memory. Ranade. Foundations of Computer Science. 1985.
- Data broadcasting in SIMD computers, Nassimi and Sahni. IEEE Transactions on Computers. c-39.
- Parallel algorithms to set up the Benes Permutation Network. Nassimi and Sahni. IEEE Transactions on Computers. c-31.
- Bitonic Sort on Mesh-Connected Parallel Computers. Nassimi and Sahni. IEEE Transactions on Computers. c-27.
- Parallel Permutation and Sorting Algorithms and a New Generalized Connection Network. Nassimi and Sahni. JACM.
- Sorting networks and their applications. Batcher. AFIPS Conference Proceedings.
- Deterministic sorting in nearly logarithmic time on the hypercube and related computers. Cypher and Plaxton. 22nd. Annual Symposium on Theory of Computing.
- Optimal sorting on feasible parallel computers. Cypher and Sanz. IBM Almaden Research Center.
- Tight bounds on the complexity of parallel sorting. Leighton. IEEE Transactions on Computers.
- Routing, Merging and Sorting on Parallel Models of Computation Borodin and Hopcroft. Symposium on Theory of Computing.
- An $O(\log N)$ deterministic packet routing scheme. Upfal. 21 Annual ACM-SIGACT Symposium on Theory of Computing.