

# ISAM 2007

2007 IEEE International Symposium on Assembly and Manufacturing  
(formerly IEEE International Symposium on Assembly and Task Planning)

July 22-25, 2007, Ann Arbor, Michigan, USA

Sponsored by IEEE Robotics and Automation Society and technical co-sponsored by ASME Design Engineering Division

## Conference Program

**Venue:** The 4<sup>th</sup> floor, Horace H. Rackham School of Graduate Studies Building, 915 E. Washington St., Ann Arbor, MI 48109-1070.

### SUNDAY, July 22, 2007

5:00 pm - 7:00 pm	Registration and Welcome Reception (Assembly Hall)
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### MONDAY, July 23, 2007

8:00 am - 3:00 pm	Registration (Assembly Hall)	
8:20 am - 8:50 am	Continental Breakfast (Assembly Hall)	
8:45 am - 9:00 am	Opening Remarks (Amphitheatre)	
9:00 am - 10:00 am	Keynote Talk: Professor Francesco Jovane, High Value K-based Manufacturing: addressing the new Industrial Revolution challenge (Amphitheatre)	
10:00 am - 10:30 am	Coffee Break (Assembly Hall)	
10:30 am - 11:50 am	Session MoA1: Fixturing, grasping, and manipulation (East Conference Room)	Session MoA2: Control of Manufacturing Processes and Systems (West Conference Room)
11:50 am - 1:30 pm	Lunch (on your own)	
1:30 pm - 2:50 pm	Session MoB1: Assembly and Disassembly Planning (East Conference Room)	Session MoB2: Modeling and Optimization of Manufacturing Systems (West Conference Room)
2:50 pm - 3:20 pm	Coffee Break (Assembly Hall)	
3:20 pm - 5:00 pm	Session MoC1: CAD/CAM and Manufacturing Processes (East Conference Room)	Session MoC2: Automated, Robotic, and Virtual Assembly (West Conference Room)
5:30 pm - 6:30 pm	ISAM Organizing Committee Meeting (West Conference Room: everyone invited)	

### TUESDAY, July 24, 2007

8:00 am - 3:00 pm	Registration (Assembly Hall)	
8:20 am - 8:50 am	Continental Breakfast (Assembly Hall)	
8:50 am - 9:00 am	Announcements (Amphitheatre)	
9:00 am - 10:00 am	Keynote Talk: Professor Vijay Kumar, Modeling, analysis and design of dynamical systems with multiple frictional contacts (Amphitheatre)	
10:00 pm - 10:30 pm	Coffee Break (Assembly Hall)	

10:30 am - 11:50 am	Session TuA1: Micro Assembly Systems (East Conference Room)	Session TuA2: Motion and contact analysis and planning (West Conference Room)
11:50 am - 1:30 pm	Lunch (on your own)	
1:30 pm - 2:50 pm	Session TuB1: Micro Assembly Processes (East Conference Room)	Session TuB2: Planning and Scheduling of Manufacturing Systems (West Conference Room)
2:50 pm - 3:20 pm	Coffee Break (Assembly Hall)	
3:20 pm - 4:40 pm	Session TuC1: Self- and Micro Assembly (East Conference Room)	Session TuC2: Evolvable Assembly (West Conference Room)
4:45 pm - 5:00 pm	Closing Remarks (Amphitheatre)	
7:30 pm - 10:30 pm	Symposium Banquet (Michigan Room, Michigan League 2F)	

### WEDNESDAY, July 25, 2007

9:00 am - 1:00 pm	Ford Rouge Factory Tour (meet in front of Rackham Building)
1:00 pm - 2:30 pm	Lunch (on your own)
2:30 pm - 5:30 pm	University of Michigan Laboratory Tour (meet in front of Rackham Building)

### Monday, July 23, 2007

#### Session MoA1: Fixturing, grasping, and manipulation (East Conference Room, Rackham 4F)

Session Chair: H. Wakamatsu

Session Co-Chair: K. Saitou

- 10:30-10:50 Modeling of Flexible Belt Objects Toward Their Manipulation, *H. Wakamatsu, T. Yamasaki, E. Arai, S. Hirai*
- 10:50-11:10 Searching Form-Closure Fixturing Points on Objects Described by Triangular Meshes, *R. Suarez, J. Rosell*
- 11:10-11:30 Variation Analysis of Three Dimensional Non-Rigid Assemblies, *B. Lee, M. Shalaby, R. Collins, V. Crisan, D. Robinson, K. Saitou*
- 11:30-11:50 Development of Flexible Gripper for Precision Assembly of Cylinder Locks, *C. Wögerer, W. Mann, G. Peschl*

#### Session MoA2: Control of Manufacturing Processes and Systems (West Conference Room, Rackham 4F)

Session Chair: C. Shi

Session Co-Chair: G. Bright

- 10:30-10:50 Inline Control System for Hot Steel Pipes Basing on Thermographic Methods, *C. Wögerer, G. Traxle*
- 10:50-11:10 The Look-Ahead Based Adaptive Motion Control for High-Speed Machining of Complicated Contours, *C. Shi, P. Ye, K. Yang, Q. Lv*
- 11:10-11:30 Sensor System for Multi Axis Automated Assembly and Manufacturing Machines, *G. Bright*
- 11:30-11:50 Reliable Control of Complex Manufacturing Cells, *J. Richardsson, K. Andersson, M. Fabian*

**Session MoB1: Assembly and Disassembly Planning (East Conference Room, Rackham 4F)**

Session Chair: S. Gupta

Session Co-Chair: K. Pochiraju

- 1:30-1:50 Generation of Assembly Sequences with K-Ary Operations, *W. Haixia, D. Ceglarek*
- 1:50-2:10 Generating Multi-Stage Molding Plans for Articulated Assemblies, *A. Priyadarshi, S. Gupta*
- 2:10-2:30 Automatic Disassembly Plan Generation from CAD Assembly Models, *J. Javier, B. Lezama, K. Pochiraju*
- 2:30-2:50 Disassembly Precedence Graph Generation, *S. Tumkor, G. Senol*

**Session MoB2: Modeling and Optimization of Manufacturing Systems (West Conference Room, Rackham 4F)**

Session Chair: A. Drathen

Session Co-Chair: G. Xiao

- 1:30-1:50 Bottleneck Detection of Manufacturing Systems Using Data Driven, *L. Li, Q. Chang, J. Ni, G. Xiao, S. Biller*
- 1:50-2:10 Off-Line Optimisation of Complex Automated Production Lines - Applied on a Sheet-Metal Press Line, *B. Svensson, F. Danielsson*
- 2:10-2:30 Modeling and Optimization of Hierarchical Routings Based on Petri Nets, *A. Drathen*
- 2:30-2:50 Modeling and Performance Optimization of Multiple Product FMS Using Colored Petri Net and Response, *T. Aized, K. Takahashi, I. Hagiwara*

**Session MoC1: CAD/CAM and Manufacturing Processes (East Conference Room, Rackham 4F)**

Session Chair: C. Mascle

Session Co-Chair: S.-S. Yeh

- 3:20-3:40 Interpolation of NURBS Surfaces by Using the Extended Branch Structure of Basis Functions, *S. Yeh*
- 3:40-4:00 Machining Process Planning Using Decomposition of Delta Volume, *C. Mascle, H. Lu, R. Maranzana*
- 4:00-4:20 Investigation of Revolute Joint Clearances Created by In-Mold Assembly Process, *A. Ananthanarayanan, C. Thamire, S. Gupta*
- 4:20-4:40 An Approach to Cost Estimation of Mould Manufacturing Processes for Spray Component, *S. Park*
- 4:40-5:00 Super-Finishing Using Fine CBN Stone to Achieve Nano-Mirror Surfaces on Hardened Steel, *S. Naka, E. Aoyama, T. Hirogaki, Y. Onchi, K. Ogawa*

**Session MoC2: Automated, Robotic, and Virtual Assembly (West Conference Room, Rackham 4F)**

Session Chair: C. Wögerer

Session Co-Chair: T. Lim

- 3:20-3:40 Isolation of Small Coil Spring, *C. Wögerer, G. Nittmann, T. Panner*
- 3:40-4:00 Design of a Shuttle Used in an Innovative Pick and Place Machine Concept, *P. Alexander, H. Goede*
- 4:00-4:20 Experimental Validation of Task Skill Transfer Approach Using a Humanoid Robot, *M. Shimizu, W. Yoon, K. Kitagaki*
- 4:20-4:40 Assessment of a Haptic Virtual Assembly System That Uses Physics-Based Interactions, *J. Corney, T. Lim, J. Ritchie*
- 4:40-5:00 Assembly Based Fabrication, *H. Medellin, J. Corney, T. Lim, J. Ritchie, B. Davies*

**Tuesday, July 24, 2007**

**Session TuA1 (Organized Session): Micro Assembly - Systems (East Conference Room, Rackham 4F)**

Session Chair: R. Heikkilä

Session Co-Chair: S. Ratchev

- 10:30-10:50 Desktop Factory - New Approach for Lean Micro Assembly, *O. Klemm*
- 10:50-11:10 Possibilities of a Microfactory in the Assembly of Small Parts and Products - First Results of the M4-Project, *R. Heikkilä, I. Karjalainen, J. Uusitalo, A. Vuola, R. Tuokko*
- 11:10-11:30 ASSEMIC: Handling and Assembly in the Micro Dimension, *A. Almansa, C. Wögerer*
- 11:30-11:50 Design for Microassembly - a Methodology for Product Design and Process Selection, *C. Tietje, S. Ratchev*

**Session TuA2: Motion and contact analysis and planning (West Conference Room, Rackham 4F)**

Session Chair: M. Inui

Session Co-Chair: R. Suarez

- 10:30-10:50 Fast Collision Detection Method for the Scaled Convex Polyhedral Objects with Relative Motion, *W. Pan, J. Liu, W. Ku*
- 10:50-11:10 Determination of Independent Contact Regions on Discretized 3D Objects, *M. Alejandro, R. Garzon, R. Suarez*
- 11:10-11:30 Automatic Generation of a High-Level Contact State Graph for Assembly between Curved Objects, *P. Tang, J. Xiao*
- 11:30-11:50 A GPU based Algorithm for Determining the Optimal Cutting Direction in Deep Mold Machining, *K. Morimoto, M. Inui*

**Session TuB1 (Organized Session): Micro Assembly - Processes (East Conference Room, Rackham 4F)**

Session Chair: , M. Tichem

Session Co-Chair: A. Delchambre

- 1:30-1:50 A Method for Measurement and Characterization of Microdispensing Process, *C. Wögerer, A. Almansa, S. Bou, W. Mann, D. Fratila, W. Palfinger, W. Möst*
- 1:50-2:10 Influence of geometrical parameters on capillary forces, *A. Chau, S. Régnier, A. Delchambre, P. Lambert*
- 2:10-2:30 Study of Cylinder/plan Capillary Force Near Millimeter Scale and Experimental Validation, *J. Vitard, P. Lambert, S. Régnier*
- 2:30-2:50 An Industrial Prototype of a Liquid Solidification Based Micro-Gripping System, *M. Tichem*

**Session TuB2: Planning and Scheduling of Manufacturing Systems (West Conference Room, Rackham 4F)**

Session Chair: A. Madureira

Session Co-Chair: J. Hu

- 1:30-1:50 Proposal of a Cooperation Mechanism for Team-Work Based Multi-Agent System in Dynamic Scheduling through Meta-Heuristics, *A. Madureira, N. Gomes, J. Santos, C. Ramos*
- 1:50-2:10 Transitory Assembly Scheduling Based on Deterministic Correlation Functions, *C. Fiedler, W. Meyer*
- 2:10-2:30 Manufacturing Multiagent System for Scheduling Optimization of Production Tasks Using Dynamic Genetic Algorithms, *M. Roldan, B. Fernandez, E. Kutanoğlu*
- 2:30-2:50 Sequence Planning to Minimize Complexity in Mixed-Model Assembly Lines, *X. Zhu, S. J. Hu, Y. Koren, S. Marin, N. Huang*

**Session TuC1: Self- and Micro Assembly (East Conference Room, Rackham 4F)**

Session Chair: G. Chirikjian

Session Co-Chair: M. Matsumoto

- 3:20-3:40 A Design of Self Reproducing Hardware, *M. Matsumoto, S. Hashimoto*
- 3:40-4:00 A Memoryless Robot That Assembles Seven Subsystems to Copy Itself, *A. Liu, M. Sterling, D. Kim, A. Pierpont, A. Schlothauer, M. Moses, K. Lee, G. Chirikjian*
- 4:00-4:20 Functional Tolerancing and Testing Increase Microassembly Yield, *J. Gfeller, S. Koelemeijer, F. Bourgeois, R. Richard, J. Jacot*
- 4:20-4:40 New Bottom-Up Algorithm for Assembly Plan Generation: Opportunities for Micro-Factory Design, *C. Perrard, P. Lutz, P. Salgueiro*

**Session TuC2 (Organized Session): Evolvable Assembly (West Conference Room)**

Session Chair: D. Semere

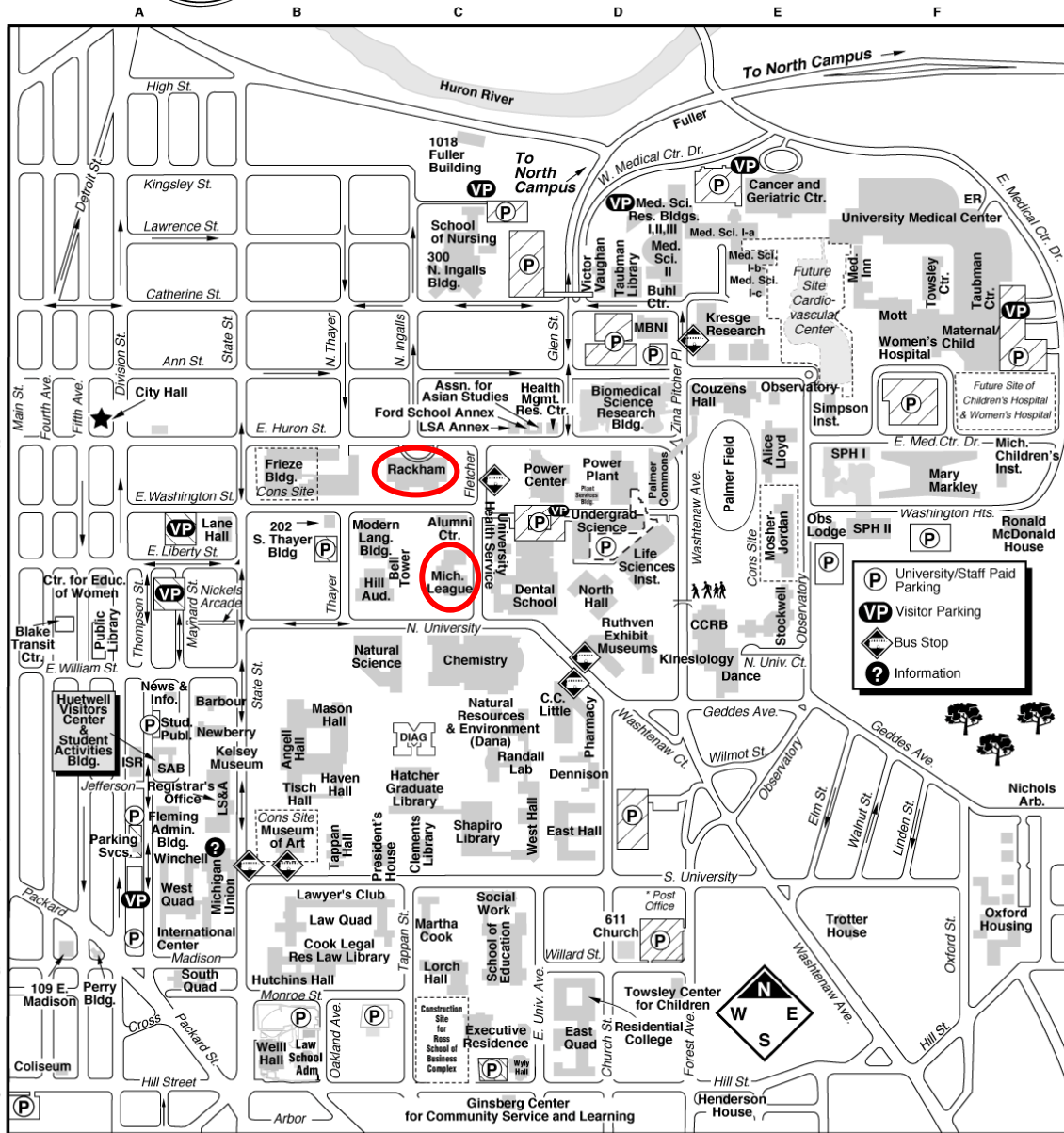
Session Co-Chair: J. Stahre

- 3:20-3:40 Evolvable Assembly Systems: Developments and Advances, *D. Semere, J. Barata, M. Onori*
- 3:40-4:00 Evolvable Assembly Systems: Towards User Friendly Manufacturing, *R. Frei, L. Ribeiro, J. Barata, D. Semere*
- 4:00-4:20 An Approach to Proactive Assembly Systems - Towards competitive assembly systems, *K. Dencker, J. Stahre, P. Gröndahl, L. Mårtensson, T. Lundholm, C. Johansson*

# Rackham Building and Michigan League



## University of Michigan Central Campus

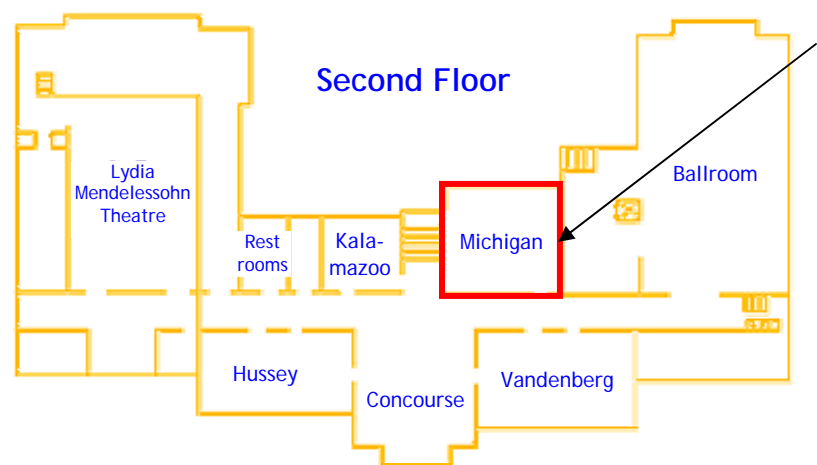
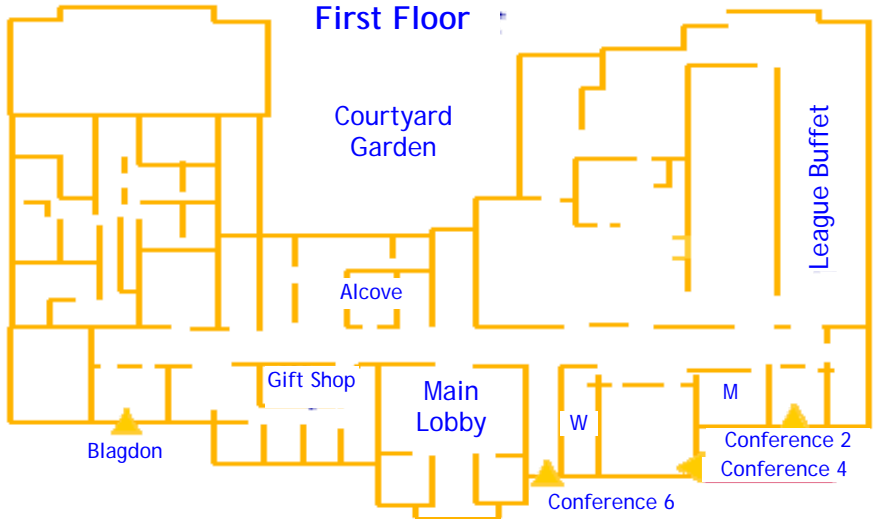


To Wolverine Tower ↓

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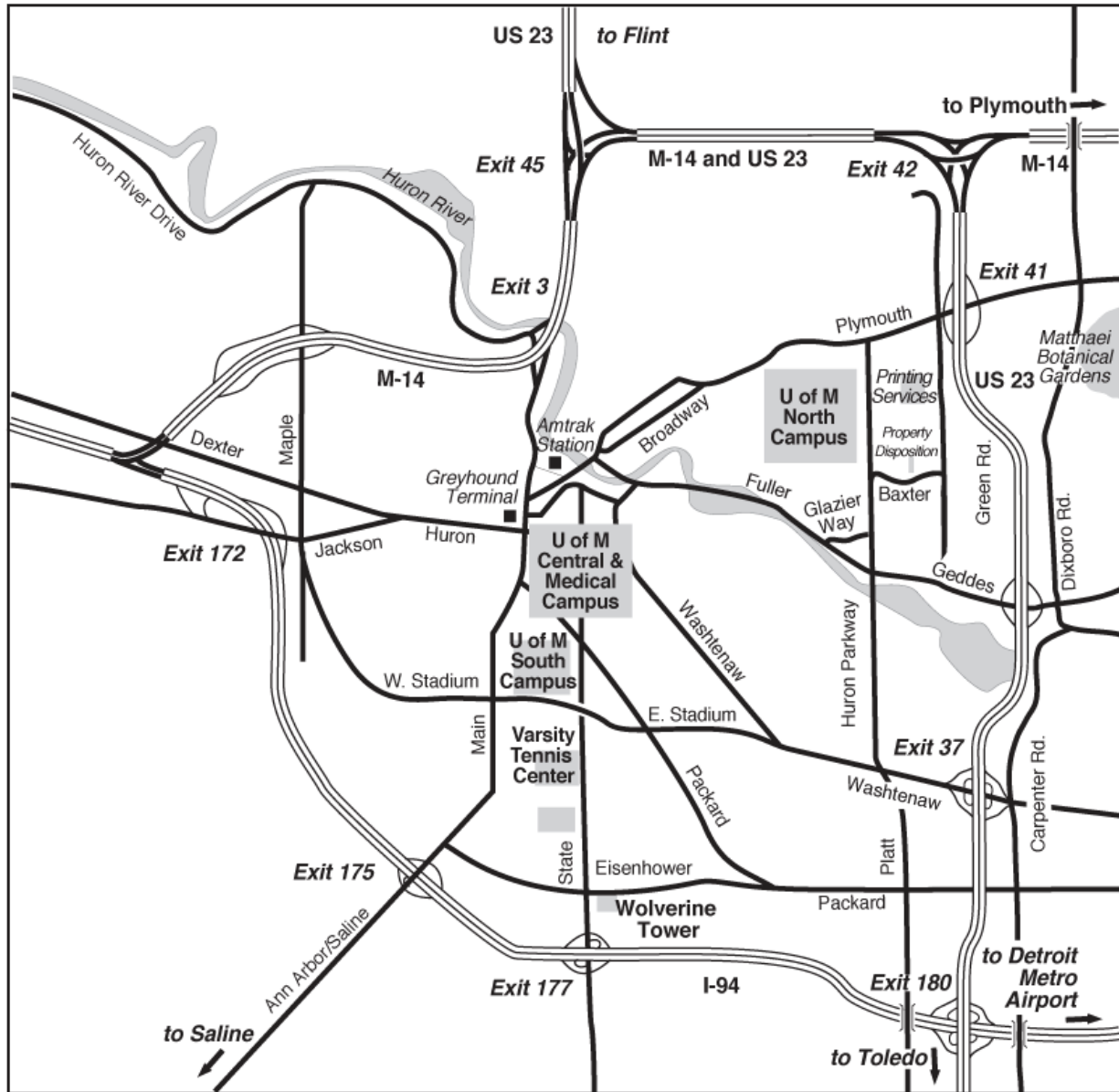
# Michigan League 2F



Michigan Room



# Ann Arbor



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