Héctor Muñoz-Avila

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A. Biographical Information

Education.

- Ph.D. in Computer Science, University of Kaiserslautern, Kaiserslautern, Germany, 1998
- M.S. in Computer Science, Andes University, Bogota, Colombia, 1991
- B.S. in Mathematics, Andes University, Bogota, Colombia, 1991
- B.S. in Computer Science, Andes University, Bogota, Colombia, 1989

Employment History

- Department of Computer Science and Engineering, Lehigh University, Associate Professor, August 2007 – present
- Department of Computer Science and Engineering, Lehigh University, Assistant Professor, August 2001 – 2007
- Department of Computer Science, University of Maryland at College Park, Post-Doctoral researcher, July 1998 – July 2001
- Research center CIJUS, Law School of the Andes University, Bogota, Colombia. Researcher, intelligent decision support tools for legal reasoning, March 1990 – August 1992

B. Publications

Chapters in Books.

- Lee-Urban, S., Smith, M. & Munoz-Avila, H. (2008) Learning Winning Policies in Team-Based First-Person Shooter Games. To appear In: *AI Game Programming Wisdom 4*. Charles River Media
- Muñoz-Avila, H. & Hoang, H. (2006) Coordinating Teams of Bots with Hierarchical Task Network Planning. *AI Game Programming Wisdom 3*. Charles River Media
- Muñoz-Avila, H., Gupta, K., Aha, D.W., & Nau, D.S. (2002) Knowledge based project planning. In: R. Dieng-Kuntz & N. Matta (Eds.) *Knowledge Management and Organizational Memories*. Kluwer Academic Publishers.
- Bergmann, R., Muñoz-Avila, H., Veloso, M., Melis, E. (1998*).* Case-based reasoning applied to planning tasks. In: M. Lenz, B. Bartsch-Spörl, H.-D. Burkhard, & S. Wess (Eds.). Case-*Based Reasoning Technology from Foundations to Applications*, Springer.

Refereed Journals

- Muñoz-Avila, H., & Cox, M. (2008) Case-based plan adaptation: An analysis and review. *IEEE Intelligent Systems*. IEEE inc.
- Xu, K. & Muñoz-Avila, H. (2007) CaBMA: A Case-Based Reasoning System for Capturing, Refining and Reusing Project Plans. To appear in: *Knowledge and Information Systems (KAIS)*. Springer.

- Ponsen, M., Muñoz-Avila, H., Spronk, P., Aha, D. (2007) Knowledge Acquisition for Adaptive Game AI. To appear in: *Science of Computer Programming. Special Issue on Computer Games*. Elsevier.
- Cox, M., Muñoz-Avila, H., & Bergmann, R. (2006) Case-based planning. To appear in: *The Knowledge Engineering Review*. Cambridge press.
- Muñoz-Avila, H., Ricci, F., Burke R. (2006) The Sixth International Conference on Case-Based reasoning. *AI Magazine*. AAAI Press
- Ponsen, M., Muñoz-Avila, H., Spronk, P., Aha, D. (2006) Automatically generating game tactics with evolutionary learning. *AI Magazine*. AAAI Press.
- Ilghami, O., Nau, D.S., Muñoz-Avila, H., and Aha, D. (2005) Learning Preconditions for Planning from Plan Traces and HTN Structure. *Computational Intelligence*
- Nau, T.-C. Au, O. Ilghami, U. Kuter, Muñoz-Avila, H. Murdock, J. W., Wu, D., and Yaman, F. (2005) Applications of SHOP and SHOP2. *IEEE Intelligent Systems*. IEEE inc.
- Dix, J., Muñoz-Avila, H., Nau D. S. (2003) IMPACTing SHOP: Putting an AI Planner into a Multi-Agent Environment. *Annals of Mathematics and Artificial Intelligence*. Baltzer Science Publishers.
- Marling, C., Sqalli, M., Rissland, E., Muñoz-Avila, H., & Aha, D.W. (2002) Case-Based Reasoning Integrations. *AI Magazine*. AAAI Press.
- Muñoz-Avila, H. (2001) Case-Base Maintenance by Integrating Case Index Revision and Case Retention Policies in a Derivational Replay Framework. *Computational Intelligence*. Blackwell Publishers
- Nau, D.S., Cao, Y., Lotem, A., & Muñoz-Avila, H. (2001) The Shop Planning System. In *AI Magazine*. Vol 3, n. 1. AAAI Press.
- Aha, D.W., Breslow, L.A., Muñoz-Avila, H. (2001) Conversational Case-Based Reasoning. *Applied Intelligence*. Kluwer Academic Publishers.
- Muñoz-Avila, H., Hendler, J. A., & Aha, D. W. (1999) Conversational Case-Based Planning. *Review of Applied Expert Systems*. Taylor Graham Publishing.
- Veloso, M., Muñoz-Avila, H. & Bergmann, R. (1996) Case-based Planning: Selected Methods and Systems. *AI Communications* 9 (3), IOS Press.
- Bergmann, R., Muñoz-Avila, H. & Veloso, M.M. (1996) Fallbasiertes Planen: Ausgewaehlte Methoden und Systeme. *KI - Künstliche Intelligenz* Jan. '96.

Refereed Conference and Workshop Proceedings

- Hogg, C., Kuter, U., and Munoz-Avila, H. (2009) Learning Hierarchical Task Networks for Nondeterministic Planning Domains. *Proceedings of the Twenty-first International Joint Conference on Artificial Intelligence (IJCAI-09)*. AAAI Press. *(Scientific oral presentation Acceptance rate for scientific oral presentations:* 331/1290 = 25.7%*).*
- Zhuo, H. H., Hu, D. C., Hogg, C. , Yang, Q., , and Munoz-Avila, H. (2009) Learning HTN Method Preconditions and Action Models from Partial Observations. *Proceedings of the Twenty-first International Joint Conference on Artificial Intelligence (IJCAI-09).* AAAI Press. *(Scientific oral presentation Acceptance rate for scientific oral presentations:* 331/1290 = 25.7%*).*
- Zhuo, H. H., Hu, D. C., Hogg, C. , Yang, Q., , and Munoz-Avila, H. (2009) Learning Model Structures in AI Planning from Partial Observations. *Proceedings of the IJCAI-09*

Workshop on Learning Structural Information from Traces (STRUCK-09). AAAI Press.

- Hogg, C., Kuter, U., and Munoz-Avila, H. (2009) From Plan Traces to Hierarchical Task Networks Using Reinforcements: A Preliminary Report. *Proceedings of the IJCAI-09 Workshop on Learning Structural Information from Traces (STRUCK-09).* AAAI Press.
- Lee-Urban, S., Munoz-Avila, H. (2009) Adaptation Versus Retrieval Trade-Off Revisited: an Analysis on Boundary Conditions. *Proceedings of the 8th International Conference on Case-Based Reasoning (ICCBR-09).* Springer.
- Li, H., Munoz-Avila, H., Bramsen, D., Hogg, C., Alonso, R. (2009) Spatial Event Prediction by Combining Value Function Approximation and Case-Based Reasoning. *Proceedings of the 8th International Conference on Case-Based Reasoning (ICCBR-09).* Springer. *(Scientific oral presentation Acceptance rate for scientific oral presentations: 17/55 = 30%)*
- Hogg, C., Munoz-Avila, H., and Kuter, U. (2008) HTN-MAKER: Learning HTNs with Minimal Additional Knowledge Engineering Required. *To appear in Proceedings of the Twenty-Third AAAI Conference on Artificial Intelligence (AAAI-08). (Scientific oral presentation Acceptance rate for scientific oral presentations: 937/227 = 24%).*
- Kuchibatla, V., and Muñoz-Avila, H. (2008) An Analysis on Transformational Analogy: General Framework and Complexity. *To appear in Proceedings of the Twenty-Third AAAI Conference on Artificial Intelligence (AAAI-08). Nectar track. (Scientific oral presentation Acceptance rate for scientific oral presentations: 17/79 = 21%)*
- Vasta, M., Lee-Urban S. & Muñoz-Avila, H. (2007) RETALIATE: Learning Winning Policies in First-Person Shooter Games. *Proceedings of the Seventeenth Innovative Applications of Artificial Intelligence Conference (IAAI-07).* AAAI Press. *(Scientific oral presentation).*
- Warfield, I., Hogg, C., Lee-Urban, S., Muñoz-Avila, H. (2007) Adaptation of Hierarchical Task Network Plans. *Proceedings of the Twentieth Flairs International Conference (FLAIRS-07).* AAAI Press. *(Scientific oral presentation).*
- Hogg, C. & Munoz-Avila, H. (2007) Learning of Tasks Models for HTN Planning. *Proceedings of the ICAPS-07 Workshop on AI Planning and Learning (AIPL).* AAAI Press.
- Lee-Urban, S., Parker, A., Kuter, U., Munoz-Avila, H., & Nau, D. (2007) Transfer Learning of Hierarchical Task-Network Planning Methods in a Real-Time Strategy Game. *Proceedings of the ICAPS-07 Workshop on ICAPS 2007 Workshop on Planning and Learning (AIPL).* AAAI Press.
- Sanchez Ruiz-Granados, A., Lee-Urban, S. & Munoz-Avila, H., Gonzalez Calero, P. A., Diaz Agudo, B. (2007) Game AI for a Turn-based Strategy Game with Plan Adaptation and Ontology-based retrieval. *Proceedings of the ICAPS-07 Workshop on ICAPS 2007 Workshop on Planning in Games.* AAAI Press.
- Kuchibatla, V., and Muñoz-Avila, H. (2006) An Analysis on Transformational Analogy: General Framework and Complexity. *Proceedings of European Conference in Case-based reasoning (ECCBR-06).* Springer. *(Scientific oral presentation Acceptance rate for scientific oral presentations: 19/75 = 25%).*
- Lee-Urban, S. Muñoz-Avila, H. (2006) An study of Process Languages for Planning Tasks. *Proceedings of the ICAPS-06 Doctoral Consortium.*
- Ilghami, O., Nau, D.S., and Muñoz-Avila, H. (2006) Learning to Do HTN Planning. *Proceedings of the International Conference on Automated Planning & Scheduling (ICAPS-06).* AAAI Press.
- Xu, K and Muñoz-Avila, H. (2005) A Domain-Independent System for Case-Based

Task Decomposition without Domain Theories. *Proceedings of the Twentieth National Conference on Artificial Intelligence (AAAI-05).* AAAI Press. *(Scientific oral presentation. Acceptance rate for scientific oral presentations: 148/803 = 18%)*

- Hoang, H., Lee-Urban, S., and Muñoz-Avila, H. (2005) Hierarchical Plan Representations for Encoding Strategic Game AI . *Proceedings of Artificial Intelligence and Interactive Digital Entertainment Conference (AIIDE-05).* AAAI Press. *(Scientific oral presentation).*
- Ponsen, M., Muñoz-Avila, H., Spronck, P., and Aha, D. (2005) Automatically Acquiring Domain Knowledge For Adaptive Game AI Using Evolutionary Learning . *Proceedings of the Seventeenth Innovative Applications of Artificial Intelligence Conference (IAAI-05).* AAAI Press. *(Scientific oral presentation).*
- Ponsen, M., Lee-Urban, S., Muñoz-Avila, H. (2005). Stratagus: An open-source game engine for research in real-time strategy games. In *Reasoning Representation, and Learning in Computer Games: Papers from the IJCAI Workshop.*
- Ilghami, O., Muñoz-Avila, H., Nau, D.S., and Aha, D. Learning Approximate Preconditions for Methods in Hierarchical Plans. *Proceedings of the 22nd International Conference on Machine Learning (ICML-05).* AAAI Press. (*Scientific oral presentation. Acceptance rate for scientific oral presentations: 135/491 = 27%*)
- Xu, K., & Muñoz-Avila, H. (2004) CaBMA: Case-Based Project Management Assistant. *Proceedings of the Sixteenth Innovative Applications of Artificial Intelligence Conference (IAAI-04).* AAAI Press. *(Scientific oral presentation).*
- Muñoz-Avila, H. & Aha, D. (2004) On the Role of Explanation for Hierarchical Case-Based Planning in Real-Time Strategy Games. *Proceedings of ECCBR-04 Workshop on Explanations in CBR.* Springer. *(Scientific oral presentation).*
- Sahasrabudhe, S., & Muñoz-Avila, H. (2004) Discovering Causal Chains by Integrating Plan Recognition and Sequential Pattern Mining. *Proceedings of the Seventeenth Flairs International Conference (FLAIRS-04).* AAAI Press. *(Scientific oral presentation).*
- Muñoz-Avila, H. & Fisher, T. (2004) Strategic Planning for Unreal Tournament Bots. *Proceedings of AAAI-04 Workshop on Challenges on Game AI.* AAAI Press. *(Scientific oral presentation).*
- Qasem, A., Heflin J., and Muñoz-Avila, H. (2004) Efficient Source Discovery and Service Composition for Ubiquitous Computing Environments. In Workshop on Semantic Web Technology for Mobile and Ubiquitous Applications, ISWC 2004. *(Scientific oral presentation).*
- Xu, K. & Muñoz-Avila, H. (2003) Maintaining Consistency in Project Planning Reuse. *Fifth International Conference on Case-based Reasoning (ICCBR-03).* Springer. *(Scientific oral presentation. Acceptance rate for scientific oral presentations: 19/92 = 21%)*
- Xu, K. & Muñoz-Avila, H. (2003) CBM-Gen+: An Algorithm for Reducing Case Base Inconsistencies in Hierarchical and Incomplete Domains. *Fifth International Conference on Case-based Reasoning (ICCBR-03).* Springer. *(Scientific oral presentation. Acceptance rate for scientific oral presentations: 19/92 = 21%)*
- Au, T.C., Muñoz-Avila, H., & Nau, D.S. (2002) On the Complexity of Plan Adaptation by Derivational Analogy in a Universal Classical Planning Framework. In proceedings of the Sixth European Conference on Case-Based Reasoning (ECCBR-02). ***Best Research Paper Award.*** *(Scientific oral presentation. Acceptance rate for scientific oral presentations: 23/88 = 26%)*

- Mukammalla, S. & Muñoz-Avila, H. (2002) Case Acquisition in a Project Planning Environment. In proceedings of the Sixth European Conference on Case-Based Reasoning (ECCBR-02). Springer. *Nominated for Best Research Paper Award (Scientific oral presentation. Acceptance rate for scientific oral presentations: 23/88 = 26%)*
- Dix, J., Munoz-Avila, H., Nau D., and Zhang, L. Planning in a Multi-Agent Environment: Theory and Practice. In proceedings of AAMAS 2002: C. Castelfranchi and W. L. Johnson (Eds.): Proceedings of the First International Joint Conference on Autonomous Agents and Multiagent Systems. July 15-19, 2002, Bologna, Italy. *Extended Abstract*.
- Ilghami, O., Nau, D.S., Muñoz-Avila, H., & Aha, D.W. (2002) CaMeL: Learning Methods for HTN Planning. *In Proceedings of the The Sixth International Conference on AI Planning & Scheduling (AIPS'02)*. AAAI Press. *(Scientific oral presentation).*
- Heflin, J. and Munoz-Avila, H. (2002) LCW-Based Agent Planning for the Semantic Web. In *Ontologies and the Semantic Web. Papers from the 2002 AAAI Workshop* WS-02-11. AAAI Press, Menlo Park, CA. *(Scientific oral presentation).*
- Muñoz-Avila, H., Aha, D.W., Nau D. S., Breslow, L.A., Weber, R., & Yamal, F. (2001) SiN: Integrating Case-based Reasoning with Task Decomposition. *Proceedings of the Seventeenth International Joint Conference on Artificial Intelligence (IJCAI-2001*). AAAI Press. (*Scientific oral presentation. Acceptance rate for scientific oral presentations:* 25%)
- Nau D. S., Muñoz-Avila, H., Cao, Y., Lotem, A., & Mitchel, S. (2001) Total-Order Planning with Partially Ordered Subtasks. *Proceedings of the Seventeenth International Joint Conference on Artificial Intelligence (IJCAI-2001).* AAAI Press. (*Scientific oral presentation. Acceptance rate for scientific oral presentations:* 25%)
- Aha, D.W., Weber, R., Muñoz-Avila, H., Breslow, L.A., Gupta, K.M. (2001) Bridging the Lesson Distribution Gap. *Proceedings of the Seventeenth International Joint Conference on Artificial Intelligence (IJCAI-2001*). AAAI Press. (*Scientific oral presentation. Acceptance rate for scientific oral presentations:* 25%)
- Muñoz-Avila, H., Gupta, K., Aha, D.W., Nau, D.S. (2001) Knowledge Based Project Planning. In *IJCAI-2001 Workshop on Knowledge Management and Organizational Memories. (Scientific oral presentation).*
- Muñoz-Avila, H. Aha, D. W., Breslow, L. A., Nau, D.S. & Weber, R. (2000), Integrating Conversational Case Retrieval with Generative Planning. *Proceedings of the Fourth European Workshop on Case-Based Reasoning (EWCBR-2000)*, Trento, Italy: Springer-Verlag, LNCS/LNAI series 1898. *(Scientific oral presentation.)*
- Weber, R., Aha, D.W., Muñoz-Avila, H. & Breslow, L.A. (2000) Active Delivery for Lessons Learned Systems. *Proceedings of the Fifth European Workshop on Case Based Reasoning, (EWCBR-2000*), Trento, Italy: Springer-Verlag, LNCS/LNAI series 1898. *(Scientific oral presentation).*
- Dix, J., Muñoz-Avila, H. & Nau, D.S. (2000) IMPACTing SHOP: Planning in a Multi-Agent Environment *CLIMA 2000: Workshop on Computational Logic in Multi Agency at CL 2000*, Fariba Sadri and Ken Satoh (eds.). London, UK: Imperial College. *(Scientific oral presentation.)*
- Weber, R., Aha, D.W., Muñoz-Avila, H., & Breslow, L.A. (2000) *An intelligent lessons learned process*. Proceedings of the Twelfth International Symposium on Methodologies for Intelligent Systems. Charlotte, NC: Springer-Verlag. *(Scientific oral presentation).*
- Nau, D. S., Aha, D. W., and Muñoz-Avila, H. (2000) Ordered task decomposition.

AAAI-2000 Workshop on Representational Issues for Real-World Planning Systems. AAAI Press. *(Scientific oral presentation).*

- Muñoz-Avila, H. (1999) A Case Retention Policy based on Detrimental Retrieval. *Proceedings of the Third International Conference on Case-Based Reasoning (ICCBR-99)*. Munich, Germany: Springer-Verlag, LNCS/LNAI 1650. *(Scientific oral presentation. Acceptance rate for scientific oral presentations: 24/80 = 30%)*
- Muñoz-Avila, H., McFarlane, D., Aha, D.W., Ballas, J. Breslow. L. & Nau, D. (1999) Using guidelines to constrain interactive case-based HTN planning. *Proceedings of 3rd International Conference on Case-Based Reasoning (ICCBR-99)*. Munich, Germany: Springer-Verlag, LNCS/LNAI 1650. ***Naval Research Laboratory Paper Award.*** *(Scientific oral presentation. Acceptance rate for scientific oral presentations: 24/80 = 30%)*
- Muñoz-Avila, H., Aha, D.W., Breslow, L. & Nau, D. (1999) HICAP: An Interactive Case-Based Planning Architecture and its Application to Noncombatant Evacuation Operations. P*roceedings Of the 1999 Innovative Applications of Artificial Intelligence Conference (IAAI-99)*. Orlando, FL: AAAI Press. *(Scientific oral presentation.)*
- Nau, D., Cao, Y., Lotem, A., & Muñoz-Avila, H. (1999) SHOP: Simple Hierarchical Ordered Planner. *Proceedings of the Sixteenth International Joint Conference on Artificial Intelligence (IJCAI-99)*. Stockholm, Sweden: AAAI Press. *(Scientific oral presentation. Acceptance rate for scientific oral presentations: 195/750 = 26%)*
- Carranza, C., Muñoz-Avila, H., Weberskirch F., & Bergman, R. (1998) Proposal for a Planning Approach for Information Seeking. In R. Bergmann & A. Kott (Eds) AIPS'98 *Workshop on Integrating Planning, Scheduling and Execution in Dynamic and Uncertain Environments*. Technical Report WS-98-02, AAAI Press (1998) *(Scientific oral presentation.)*
- Muñoz-Avila, H. & Weberskirch, F. (1997) A Case Study on the Mergeability of Cases with a Partial-Order Planner. In S. Steel & R. Alami (Eds.): Recent Advances in AI Planning. *Proceedings of the third European Conference on AI Planning (ECP-97),* Toulouse, France: Springer-Verlag, LNCS/LNAI series 1348. *(Scientific oral presentation.)*
- Muñoz-Avila, H., Weberskirch, F. & Roth-Berghofer, T. (1997) On the Relation between the Context of a Feature and the Domain Theory in Case-Based Planning. In David Leake & Enric Plaza (Eds). *Proceedings 2nd Int. Conference on Case-Based Reasoning (ICCBR-97)*, Providence, RI: Springer-Verlag, LNCS/LNAI 1266 *(Scientific oral presentation. Acceptance rate for scientific oral presentations: 28/102 = 27%)*
- Muñoz-Avila, H. & Weberskirch, F. Looking at Features within a Context from a Planning Perspective. (1997) In David W. Aha & Dietrich Wettschreck (Eds). *Proceedings ECML-97 MLNet Workshop: Case-Based Learning: Beyond Classification of Feature Vectors*. Prague, Czech Republic. (Technical Report AIC-97-005). Washington, DC: Naval Research Laboratory. *(Scientific oral presentation.)*
- Weberskirch, F. & Muñoz-Avila, H. (1997) Advantages of Types in Partial-Order Planning. In: Beiträge zum 11. *Workshop Planen und Konfigurieren (PuK-97)*. Bonn, Germany: FORWISS-REPORT FR-1997-001. *(Scientific oral presentation.)*
- Muñoz-Avila, H. & Weberskirch, F. (1996) Planning for Manufacturing Workpieces by Storing, Indexing and Replaying Planning Decisions. In: *Proceedings 3rd International Conference on AI Planning Systems (AIPS-96),* Edinburgh, UK: AAAI-Press. *(Scientific oral presentation.)*
- Muñoz-Avila, H. & Huellen, J. (1996) Feature Weighting by Explaining Case-based Planning Episodes. *Proceedings European Workshop on Case-Based Reasoning (EWCBR-96),* Lausanne, Switzerland: Springer-Verlag, LNCS/LNAI series 1168. *(Scientific oral*

presentation.)

- Muñoz-Avila, H. & Weberskirch, F. (1996) Complete Eager Replay. In J. Sauer, A. Guenter, J. Hetzberg (Eds.). Beiträge zum 10. *Workshop Planen und Konfigurieren (PuK-96)*, Infix. *(Scientific oral presentation.)*
- Muñoz-Avila, H. & Huellen, J. (1995) Retrieving Cases in Structured by Using Goal Dependencies. In M.M. Veloso, A. Aamodt (Eds). *Case-Based Reasoning Research and Development. First International Conference (ICCBR-95),* Sesimbra, Portugal: Springer-Verlag, LNCS/LNAI series 1010 *(Scientific oral presentation. Acceptance rate for scientific oral presentations: 22/89 = 24%)*
- Muñoz-Avila, H., Paulokat, J. & Wess, S. (1995) Controlling Nonlinear Hierarchical Planning by Case Replay. In: *Proceedings European Workshop on Case-Based Reasoning (EWCBR-94).* Chantilly, France: Springer-Verlag: LNCS/LNAI series 984. *(Scientific oral presentation. Acceptance rate for scientific oral presentations: 19/60 = 31%)*

Invited paper:

- Muñoz-Avila, H. (2003) On The Role of The Cases in Case-Based Planning. Extended Abstract to the Invited Talk at *Fifth International Conference on Case-based Reasoning (ICCBR-03)*. Springer.

C. Awards

- Lehigh Class of 61 Professorship (2008)
- National Science Foundation CAREER Award (2007)**.**

Paper Awards.

- Au, T.C., Muñoz-Avila, H., & Nau, D.S. (2002) On the Complexity of Plan Adaptation by Derivational Analogy in a Universal Classical Planning Framework. In *proceedings of the Sixth European Conference on Case-Based Reasoning (ECCBR-02*). ***Best Research Paper Award.***
- Muñoz-Avila, H., McFarlane, D., Aha, D., Ballas, J., Breslow, L., & Nau, D. (1999) Using guidelines to constrain interactive case-based HTN planning. *Proceedings of 3rd International Conference on Case-Based Reasoning (ICCBR-99*). Munich, Germany: Springer-Verlag, LNCS/LNAI 1650. ***Naval Research Laboratory On the Spot Paper Award.***

D. Research Funding

Competitively Awarded Research Grants.

- PI: Héctor Muñoz-Avila. Title: Integrated Improvised Explosive Device (IED). AFRL STTR. Total award: $27K. 2008.
- PI: Héctor Muñoz-Avila. Title: CAREER: A Unified Architecture for Learning of, and Reasoning with, Task Models: Theory and Applications. National Science Foundation. Total award: $400K. 2007.
- PI: Héctor Muñoz-Avila. Title: Transfer Learning and Hierarchical Task Network Representations and Planning. Funding Agency: DARPA Transfer Learning Program. Total award: $198K. Optional: $50K for third year. 2005.
- PI: Héctor Muñoz-Avila. Title: Modeling and Learning AI Opponent's Behavior. Funding Agency: DARPA. Total award: $92K. 2004.
- PI: Héctor Muñoz-Avila. Title: Dynamic Case Replanning for Computer-Generated Forces under Real-Time Constraints. Funding Agency: Office of Naval Research. Total

award: $35K. 2004.

- PI: Héctor Muñoz-Avila. Title: HTN Planning and Learning in Interactive Cognitive Systems. Funding Agency: Naval Research Laboratory. Total award: $20K 2004.

Others

- Poker Academy, a private software company, donates $13K of *Texas Hold'em Poker* Software for use in artificial intelligence research projects. 2005

Currently under review.

- PI: Héctor Muñoz-Avila. Title: Learning Plan Adaptation Knowledge. National Science Foundation. Total award: $410K. 2009.

E. Editor for Scholarly Publications

- Kuter, U. & Munoz-Avila, H. (Eds.) (2009). *Proceedings of the IJCAI-09 Workshop on Learning Structural Knowledge From Observations*. Pasadena, CA: AAAI Press.
- Muñoz-Avila, H. & Francesco Ricci (Eds.) (2005). Case-Based Reasoning Research and Development. Proceedings of the 6th International Conference on Case-based Reasoning (ICCBR-05). Chicago, Il: Springer.
- Aha, D., Muñoz-Avila, H. & van Lent, M. (Eds.) (2005). IJCAI 2005 Workshop on Reasoning, Representation, and Learning in Computer Games. Edinburgh, UK: AAAI Press.
- Aha, D., & Muñoz-Avila, H. (2001) Special Issue on Interactive Case-Based Reasoning. Applied Intelligence. Kluwer Academic Publishers
- Aha, D.W., Becerra-Fernandez, I., Maurer, F., & Muñoz-Avila, H. (Eds.) (1999). Exploring Synergies of Knowledge Management and Case-Based Reasoning.. Papers from the AAAI Workshop (Technical Report WS-99-10). Menlo Park, CA: AAAI Press.

F. Professional Presentations

Invited Talks.

- SET Corporation. A Case Study of Online Adaptive AI for a Real-Tme Game. July, 2008: Washington, DC.
- Hong Kong University of Science and technology. Learning preconditions and Structure of Hierarchical Task Networks: an Overview. May, 2008: Hong Kong, China.
- National Tsing Hua University. Two Case Studies of Adaptive AI in Team-based First Person Shooter (FPS) Games. June, 2007: HsinChu, Taiwan.
- National Taiwan University. Automated Planning and Learning of Adaptive AI in Team-Based First Person Shooter (FPS) Games. June, 2007: Taipei, Taiwan.
- Rutgers Laboratory for Real-Life Reinforcement Learning. Overview of Research from the InSyTe Lab. June, 2006: New Jersey.
- Third Annual Invitational Knowledge Fusion Research Workshop (KFRW 05) OntoPlan: Planning Knowledge Fusion for Decision Support Using Semantic Web

Ontologies. October, 2004: Maryland.

- Naval Research Laboratory. Seminar Series. Universal SiN: Integrating Planning and Case-Based Reasoning in an Universal Classical Planning Framework. October, 2003: Washington, DC, USA
- Fifth International Conference on Case-based Reasoning (ICCBR-03). On the Role of Cases in Case-Based Planning. July, 2003: Trondheim, Norway.
- Lockheed Martin Advanced Technology Laboratories. Seminar Series. Integrating HTN Planning and Case-Based Reasoning. 2001. Camden, NJ, USA.

G. Teaching and Advising

Courses taught.

- CSE 318. Automata Theory and Formal Languages. Fall 2001 (instructor evaluation: 4.67/5.00; course evaluation: 4.52/5.00), Fall 2002 (instructor evaluation: 4.67/5.00; course evaluation: 4.55/5.00), Fall 2003 (instructor evaluation: 4.24/5.00; course evaluation: 4.12/5.00), Fall 2004 (instructor evaluation: 4.21/5.00; course evaluation: 4.11/5.00), Fall 2005 (instructor evaluation: 4.4/5.00; course evaluation: 4.27/5.00), Fall 2006 (instructor evaluation: 4.9/5.00; course evaluation: 4.7/5.00), Fall 2007 (instructor evaluation: 3.55/5.00; course evaluation: 3.55/5.00). Fall 2009 (instructor evaluation: 4.75/5.00; course evaluation: 4.63/5.00). On average, approximately 30 students enrolled in CSE 318. CSE 318 is a required course for the CSE degree.
- CSE 340. Design and Analysis of Algorithms. Spring 2003 (instructor evaluation: 4.35/5.00; course evaluation: 4.10/5.00), Spring 2004 (instructor evaluation: 4.65/5.00; course evaluation: 4.47/5.00), Spring 2005 (instructor evaluation: 4.75/5.00; course evaluation: 4.58/5.00). Approximate enrollment each semester is 45 students. Required course for CSE and CSB degrees.
- CSE 435/335. Intelligent Decision Support Systems. Spring 2002 (instructor evaluation: 5.00/5.00; course evaluation: 5.00/5.00). Enrollment: 9 graduate students. Fall 2003 (instructor evaluation: 4.47/5.00; course evaluation: 4.47/5.00). Enrollment: 10 graduate and 10 undergraduate students. Spring 2005 (instructor evaluation: 4.67/5.00; course evaluation: 4.56/5.00). Enrollment: 10 graduate students. Fall 2006 (instructor evaluation: 4.27/5.00; course evaluation: 4.18/5.00). Enrollment: 10 graduate and undergraduate students.
- CSE 348/448: Topics on AI Game Programming. Fall 2004. (instructor evaluation: 4.33/5.00; course evaluation: 4.53/5.00) Enrollment: 18 graduate students. Fall 2005. Spring 2005 (instructor evaluation: 4.57/5.00; course evaluation: 4.57/5.00) Enrollment: 10 undergraduate students, 10 graduate students.
- CSE 197: Computer Game Design. Spring 2006. (instructor evaluation: 4.08/5.00; course evaluation: 4.15/5.00) Enrollment: 35 undergraduate students. Spring 2007. (instructor evaluation: 4.56/5.00; course evaluation: 4.59/5.00) Enrollment: 30 undergraduate students, 6 graduate students (EDUC 497). Spring 2008. (instructor evaluation: 4.68/5.00; course evaluation: 4.73/5.00) Enrollment: 25 undergraduate students, 1 graduate student (EDUC 497).
- CSE 498 Automated Planning. Spring 2007 instructor evaluation: 4.57/5.00; course evaluation: 4.43/5.00. Enrollment: 8 undergraduate students
- CSE 409 Theory of Computation. Spring 2009 instructor evaluation: 4.92/5.00; course evaluation: 4.75/5.00. Enrollment: 12 graduate students

Courses developed.

- CSE 435/335. Intelligent Decision Support Systems. First taught in Spring 2002 and Fall 2003, Spring 2005.
- CSE 348/448: AI Game Programming. First taught in Fall 2004. Taught a second time in Spring 2005. Course is approved and in the university catalog.
- CSE 197: Computer Game Design. First taught in Spring 2006. Taught a second time in Spring 2007. Course is approved and in the university catalog.

Advising other than research direction.

(approximate number of students per year)

- Undergraduate: 12 approximately. Since 2002, always advising freshman students enrolled in Engineering
- Graduate: 2
- Other advising activities: presentations to freshman students in Engineering, various presentations and meetings with prospective students and parents, open house events, etc.

Advising research direction.

- Undergraduate:

1. Kit Ming Chan (senior project & independent study, 2003)
2. Ian Ma (senior project, 2003)
3. Hai Hoang (senior project, 2003)
4. Scott Taubman (senior project, 2003)
5. Frank Cremen (senior project, 2002)
6. Ben Mautner (senior project, 2002)
7. Chris Olsisnki (senior project, 2002)
8. Paul Tsai (senior project, 2002)
9. David Kirsch (senior project, 2002)
10. Michael Zurat (independent study, 2003)
11. Jason Carini (independent study, 2003)
12. Bryn Chung (independent study, 2002)
13. Aaron Batalion (independent study, 2003)
14. Todd Fisher (independent study, 2003)
15. Lars Holzman (independent study, 2003)
16. Jing Rong (independent study, 2004)
17. Todd Fisher (independent study, 2004)
18. Kevin Gaittens (independent study, 2004)
19. Hai Hoang (independent study, 2004)
20. Lars Holzman (independent study, 2004)

21. Michael Moll (independent study, 2004)
22. Jarret Raim (independent study, 2004)
23. John Garace (independent study, *2004*)
24. Mark Austin (senior project, *2004*)
25. Megan Vasta (independent study, *2004-2005*)
26. Adam Lupinacci (senior project, *2005*)
27. Jonathan Martin (senior project, *2005*)
28. Nikolai Moukhine (senior project, *2005*)
29. Adrienne Platner (senior project, *2005*)
30. Christopher Krammer (independent study, *2005-2006*)
31. Jay Shipper (senior project, *2006*)
32. Douglas Paul (senior project, *2006*)
33. Emily Cohen (senior project, *2007*)
34. David Heefner (senior project, *2007*)
35. Liam Page (senior project, *2007;* independent study *2008*)
36. Bryan Auslander (independent study, *2007-2008*)
37. Matt Dilts (independent study, *2007-2008;* senior project *2008*)
38. James Morrison (senior project *2008*)
39. Amanda Eyler (independent study, *2007-2008*)
40. Justin Karneeb (independent study, *2009* & senior project *2009*)
41. Kellen Guillespie (independent study, *2009*)
42. Zubair Chaudary (senior project *2009*)
43. Constantin Savtchenko (independent study, *2009*)
44. Eustace J. Mann (Cog. Science thesis. Title: The Influence of meaning: how meaningful flow affects performance and strategy formation in games, *2009*)

- Masters:

1. Sasidhar Mukkamalla (*graduated*: 2003; thesis: *Automated Case Acquisition and Reuse in Project Planning*)
2. Ke Xu (*graduated*: 2003; thesis: *Maintaining Consistency in Project Plan Reuse*)
3. Hai Hoang (*graduated: 2005*; thesis: *Planning to Coordinate: Using HTN to Coordinate Unreal® Tournament Bots*)
4. Stephen Lee-Urban (*graduated: 2005*; thesis: *TMK Models to HTNs: Translating Process Models into Hierarchical Task Networks*)
5. Ian Warfield (*graduated: 2005*; thesis: *Repair-SHOP: A Method to Minimize HTN Replanning Cost Through Integration of SHOP and GoalGraph*)
6. Kuchibatla Venkata, Sarat Chandra V (*graduated: 2006*; thesis:

Transformational Analogy: A General Framework, Semantics and Complexity)

7. Ushhan Gundevia (*graduated: 2006;* thesis: Integrating War Game Simulations with AI Testbeds: Integrating Call To Power 2 with Tielt)
8. Megan Vasta (*graduated*: 2007; thesis: *Reinforcement Learning for Controlling a Team of Bots in an FPS game*)
9. Joe Souto (*graduated*: 2007; thesis: *A gaming platform for testing AI*)
10. Brian Auslendar (graduated: 2009; thesis: *Recognizing the Enemy: Combining Reinforcement Learning with Case Based Reasoning in Domination Games*)
11. Matthew Dilts (*currently*)
12. Kellen Guillespie (*currently*)

- Doctoral.
  1. Ke Xu (*defended in summer 2006*; *graduated in Fall 2006*; dissertation: *Case-Based Task Decomposition with Incomplete Domain Descriptions*)
  2. Stephen Lee-Urban (*currently*; started in 2005)
  3. Chad Hogg (*currently*; started in 2006)
  4. Hai Hoang (*on-leave*; started in 2006)
  5. Alexandra Comen (*currently*; started in 2009)
  6. Ulit Jaidee (*currently*; started in 2009)

H. Service

University.

- Service to university
  1. Chair 2009 Graduate and Undergraduate Students Exhibition (2009)
  2. Member Student Appraisal of Instruction & Courses (2008)
  3. RCEAS College delegate to Educational Policy Committee (2009)
- Service to college
  1. Member CSE Chair search committee (2003)
  2. Cognitive Science committee (2006)
- Service to department
  1. Member Curriculum Committee (2001-2006)
  2. Chair Curriculum Committee (2002-2003)
  3. Chair CSE Seminars (2002-2003)
  4. Member Graduate Committee (2001-2002)
  5. Member Reform of Graduate Program Committee (2004)
  6. Qualifier Committee (318 & 340; 2005-2008)
  7. Chair Laboratory Renovation Committee (2005-2007)
  8. Computer Science and Design Arts Program committee (2007)

9. Community Committee (2007)
10. Chair Graduate Admissions (2008-2009)
11. Member faculty search committee (2009)
12. Member Curriculum Committee (2009)

Professional.

- Program Chair or co-chair
    1. Struck-2009: the IJCAI-09 Workshop on Learning Structural Knowledge From Observations. (2009, Pasadena, CA)
    2. ICCBR-2005: The Sixth International Conference on Case-Based Reasoning (2005, Chicago, Il)
    3. IJCAI-2005 Workshop on Reasoning, Representation, and Learning in Computer Games (2005, Edinburgh, UK)
    4. Special Track on CBR at FLAIRS-03 (2003, St. Augustine, Fl)
    5. Special Track on CBR at FLAIRS-02 (2002, Pensacola, Fl)
    6. AAAI-99 Workshop: Exploring Synergies of Knowledge Management and Case-Based Reasoning (Orlando, Fl)
- Member of Program Committee
    1. AIG-09: ECAI Workshop on Artificial Intelligence in Games
    2. AIIDE-09: Artificial Intelligence and Interactive Digital Entertainment Conference
    3. IAAI-09: The Innovations in AI Conference
    4. ICCBR-09: Conference on Case-based reasoning
    5. ExaCt-2009: Workshop on Explanation-aware Computing
    6. Special Track on CBR at FLAIRS-09
    7. AIG-08: ECAI Workshop on Artificial Intelligence in Games
    8. AIIDE-08: Artificial Intelligence and Interactive Digital Entertainment Conference
    9. IAAI-08: The Innovations in AI Conference
    10. ECCBR-08: Conference on Case-based reasoning
    11. AAAI-08 Nectar: The National Conference on Artificial Intelligence
    12. ExaCt-2008: Workshop on Explanation-aware Computing
    13. Special Track on CBR at FLAIRS-08
    14. AIPS-07 Workshop on AI Planning & Games
    15. AIPS-07 Workshop on AI planning & Learning
    16. AAAI-07: The National Conference on Artificial Intelligence
    17. ICCBR-2007: The Seventh International Conference on Case-Based

Reasoning

18. Special Track on CBR at FLAIRS-07
19. AIIDE-07: Artificial Intelligence and Interactive Digital Entertainment Conference.
20. Special Track on CBR at FLAIRS-06
21. AAAI-06: The National Conference on Artificial Intelligence
22. ECCBR-06: Conference on Case-based reasoning
23. AIIDE-06: Artificial Intelligence and Interactive Digital Entertainment Conference.
24. ECML-06: 17th European Conference on Machine Learning
25. ICEIS-05: 7th International Conference on Enterprise Information Systems
26. ICML-05: 12th International Conference on Case-based reasoning
27. ECCBR-04: 7th European Conference on Case-based Reasoning
28. AAAI-04: The National Conference on Artificial Intelligence
29. Special Track on CBR at FLAIRS-05
30. Special Track on CBR at FLAIRS-04
31. ICCBR-03: 5th International Conference on Case-Based Reasoning
32. ICCBR-03 Workshop on Mixed-Initiative Case-Based Reasoning
33. ICEIS-03: 5th International Conference on Enterprise Information Systems
34. AAAI-02: The National Conference on Artificial Intelligence
35. ICCBR-2001: The Fourth International Conference on Case-Based Reasoning
36. ICML-2000: The Seventeenth International Conference on Machine Learning
37. AAAI-99 Workshop: Exploring Synergies of Knowledge Management and Case-Based Reasoning
38. ICCBR-99: The Third International Conference on Case-Based Reasoning
39. AAAI-99: The National Conference on Artificial Intelligence
40. AIPS-98: Workshop: Integrating Planning, Scheduling and Execution in Dynamic and Uncertain Environments.
41. ECML-97 MLnet Workshop Case-based Learning: Beyond Classification of Feature Vectors

- Editorial Board

1. Computational Knowledge Journal: From Artificial Intelligence to Knowledge Management (founding member; since 2006)

2. IEEE Transactions on Computational Intelligence and AI in Games

- Reviewer
    1. AI Magazine
    2. IEEE Intelligent Systems