



Conference Report for Series Symposium on Computational Intelligence (SSCI2009)

2009. April
박 한 샘

Nashville 소개

- 테네시 주 주도
- 인구 40만의 작은 도시
- A city of Country music

- 공기 좋고 조용한 도시
- 차 없이 돌아다니기가 매우 어려움
- 비싼 물가
 - 숙박비, 택시비, 음식 값, ...
 - 모든 물건값에 tax가 추가됨





학회 소개

• 학회 소개

- IEEE Series Symposium on Computational Intelligence 2009
- Computational Intelligence **관련 20여개의 심포지엄을 함께 진행**
- **그 중 RiSS (Robotic Intelligence in Structured Space) 에서 논문 발표**

• 장소

- Sheraton Music City Hotel, Nashville, **미국**

• 기간

- 3.30 ~ 4. 2 (3.29 ~ 4. 5)



학회 일정

Conference

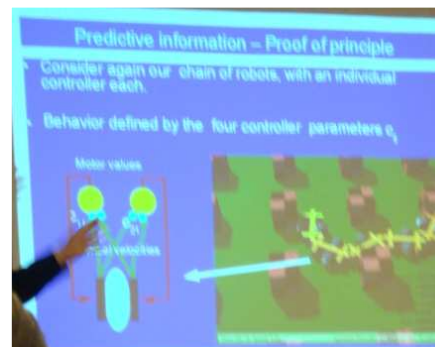
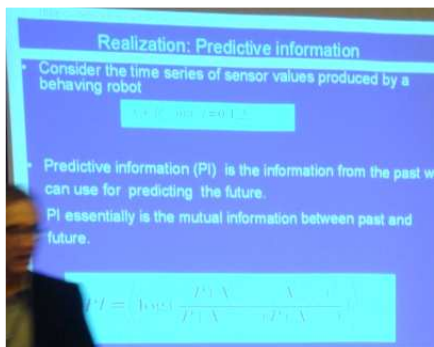


MEET IN ROOM	Hermitage C	Hermitage D	Tulip Grove E	Two Rivers	Hermitage A	Belmont & Ante	Hermitage B	Kingsley	Edgewood
MON 08:30-10:30	CIDM - 2-hour tutorial	CIBCB - keynote (session may be either 8:30-9:30 or 9:30-10:30 as will be agreed with program chairs)		HIMA - session	CIB - session	ADPRL - 2-hour tutorial - Transfer Learning for Reinforcement Learning Domains: When, What, and How	CIFER - 1-hour tutorial (session may be either 8:30-9:30 or 9:30-10:30 as will be agreed with program chairs)		
coffee break									
MON 11:00-13:00	CIDM- session	CIBCB - session	MCDM - session	HIMA - session	CIB - session	ALIFE - keynote (session may be either 11:00-12:00 or 12:00-13:00 as will be agreed with program chairs)	CIFER - session	IA - 2-hour panel	WEAH - session
lunch									
MON 14:00-16:00	CIDM- session	CIBCB - session	MCDM - keynote (session may be either 14:00-15:00 or 15:00-16:00 as will be agreed with program chairs)	HIMA - session	CIB - session	ALIFE - session	CIFER - session	IA - session	WEAH - session
coffee break									
MON 16:30-18:30	CIDM- session	CIBCB - session	MCDM - session	HIMA - 2-hour tutorial - Hybrid Intelligent Systems with Soft Computing Techniques	CIB - 2-hour panel	ALIFE - session	CIFER - 1-hour panel (session may be either 16:30-17:30 or 17:30-18:30 as will be agreed with program chairs)	IA - session	WEAH - 2-hour panel
TUE 08:30-10:30	CIDM- session	CIBCB - session	MCDM - 2-hour tutorial - Metaheuristics for Multiobjective Optimization	ADPRL - keynote (session may be either 8:30-9:30 or 9:30-10:30 as will be agreed with program chairs)	RiISS - session	ALIFE - session	CIFER - 1-hour tutorial (session may be either 8:30-9:30 or 9:30-10:30 as will be agreed with program chairs)	IA - session	CIVI - 2-hour tutorial
coffee break									
TUE 11:00-13:00	CIDM- session	CIBCB - session	MCDM - session	ADPRL - session	RiISS - session	ALIFE - keynote (session may be either 11:00-12:00 or 12:00-13:00 as will be agreed with program chairs)	CIFER - session	IA - session	Chapter Meeting
lunch									
TUE 14:00-16:00	CIDM- session	CIBCB - session	MCDM - keynote (session may be either 14:00-15:00 or 15:00-16:00 as will be agreed with program chairs)	ADPRL - session	RiISS - session	ALIFE - session	CIFER - session	CICS - 2-hour tutorial - Computational Intelligence in Cyber Security	CIVI - session
coffee break									
TUE 16:30-18:30	CIDM- session	CIBCB - 2-hour panel	MCDM - session	ADPRL - session	RiISS - session	ALIFE - session	CIFER - 1-hour panel (session may be either 16:30-17:30 or 17:30-18:30 as will be agreed with program chairs)	CIMSVP - 2-hour tutorial - Advanced Image Processing	CIVI - session
WED 08:30-10:30	CIDM- session	CIBCB - session	MCDM - 2-hour tutorial - An Introduction to Computational Intelligence in Multi-Criteria	ADPRL - session	RiISS - keynote (session may be either 8:30-9:30 or 9:30-10:30 as will be agreed with program chairs)	CICS - session	SIS - session	CIMSVP - session	ESDIS - session
coffee break									
WED 11:00-13:00	CIDM- session	CIBCB - session	MCDM - session	ADPRL - session	RiISS - session	CICS - keynote (session may be either 11:00-12:00 or 12:00-13:00 as will be agreed with program chairs)	SIS - session	CIMSVP - session	ESDIS - 2-hour panel
lunch									
WED 14:00-16:00	CIDM- session	CIBCB - session	MCDM - session	ADPRL - session	CICA - session	CICS - session	SIS - keynote (session may be either 14:00-15:00 or 15:00-16:00 as will be agreed with program chairs)	CIMSVP - session	ESDIS - session
coffee break									
WED 16:30-18:30	CIDM- session	CIBCB - session	2-hour tutorial - Constraint-based scheduling	ADPRL - session	CICA - session	CICS - session	SIS - session	CIMSVP - 2-hour panel	ESDIS - 2-hour tutorial
THU 08:30-10:30	CIIP - session	CIBCB - 2-hour tutorial	CI-Sched - session	CIVVS - session	CICA - session	CICS - 2-hour panel	SIS - session	CIVE - session	
coffee break									
THU 11:00-13:00	CIIP - session		CI-Sched - session	CIVVS - session	CICA - session	CICS - session	SIS - session	CIVE - session	
lunch									
THU 14:00-16:00	CIIP - session		CI-Sched - session	CIVVS - session	CICA - session	CICS - session		CIVE - session	
coffee break									
THU 16:30-18:30	CIIP - session		CI-Sched - session	CIVVS - session	CICA - session	CICS - session			



ALIFE Keynote Lecture 1

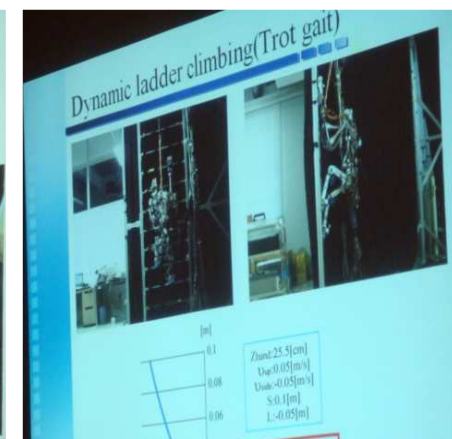
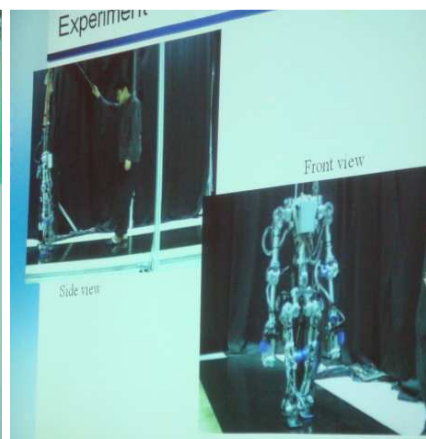
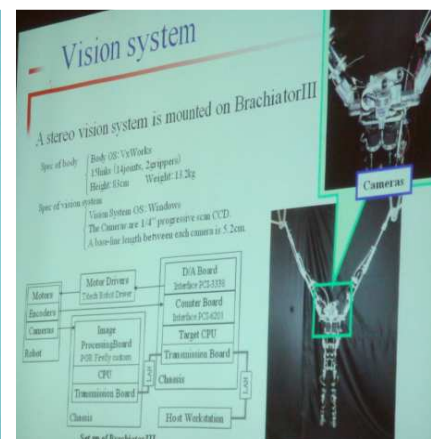
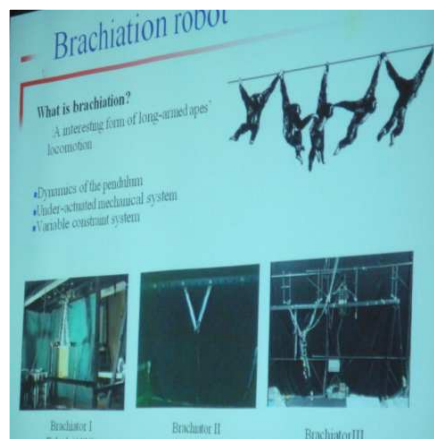
- **제목:** Guided self-organization of autonomous robot behavior
- **발표자:** Dr. Ralf Der (Max Planck Institute for Mathematics in the Sciences, Germany & Santa Fe Institute, USA)
- **내용**
 - Predicted information (PI)을 이용한 로봇 행동의 self-organization이 가능
 - $PI = \text{low} \rightarrow$ ordered behaviors, $PI = 0 \rightarrow$ random behavior, $PI = \text{high} \rightarrow ?$
 - 간단한 신경망의 학습, PI를 maximize 하는 방향으로 (센서 입력, 모터 출력)





RiSS Keynote Lecture

- **제목:** Control system for multi-locomotion robotic system
- **발표자:** Dr. Toshio Fukuda (Dept. of Micro-nano Systems Engineering & Dept. of Mechanical Science and Engineering in Nagoya Univ., Japan)
- **내용**
 - 이동하는 원숭이 로봇, 고릴라 로봇 만들기





CIDM Tutorial

- **제목:** Temporal pattern mining in symbolic time point and time interval data
- **발표자:** Fabian Moerchen (Integrated Data Systems, Siemens Corporate Research Inc.)
- **내용**
 - Symbolic time point & time interval data **간의 관계 정의 및 응용**

Temporal Operators
Allen's interval relations

- 13 relations forming an algebra
- **Any two intervals have exactly one of the relations.**
- Invented in AI for temporal reasoning: given facts with time interval derive other facts or answer specific questions.
- Later widely used in data mining
- **Disadvantages for knowledge discovery!**
- Thresholds and fuzzy extensions solve some of the problems.

Temporal Operators
Freksa's semi-interval relations

- **Semi-intervals:** one interval boundary unknown.
- Two relations between endpoints of the two suffice to uniquely identify the relation
- Easier to **represent incomplete or coarse knowledge**
- Not widely used in data mining (yet)

Time point patterns
Substring patterns

- Sequence of symbols without gaps
- Expresses concept of order
- Example: $B \rightarrow C \rightarrow B$

Symbolic expression patterns

- Extension to allow gaps (wildcards), negations, repetitions, etc.
- Example: $B \rightarrow \leftarrow \rightarrow A \mid B$

Time point patterns
Sequential patterns

- **Sequential patterns** [Agrawal/Srikant 1995]
- Sequence of (sets of) symbols
- Expresses concepts of order
- Example: $(B) \rightarrow (C) \rightarrow (A,D)$

- Observed sets of symbols at each time point can contain more symbols
- Gaps are allowed.

Time point patterns
Episode patterns

- **Episode patterns** [Manilla et al. 1995]
- Constrained partial order of (sets of) symbols
- Expresses concepts of order and concurrency
- Example: $C \rightarrow A$ and $D \rightarrow B$ within a time window

- Serial episodes: Order relation between symbols (or episodes)
- Parallel episodes: Symbols or episodes observed within time window
- Episodes: combination of serial and parallel episodes.

Time Interval patterns
Time Series Knowledge Representation

Time Series Knowledge Representation (TSKR) [Moerchen 2005]

- Extension of UTG
- Tones represent **duration** with intervals.
- Chords represent **coincidence** of Tones.
- Phrases represent **partial order** of Chords
- Compact, unambiguous representation with details on demand.
- Robust against noise in the interval boundaries.



그 외 학회 참석

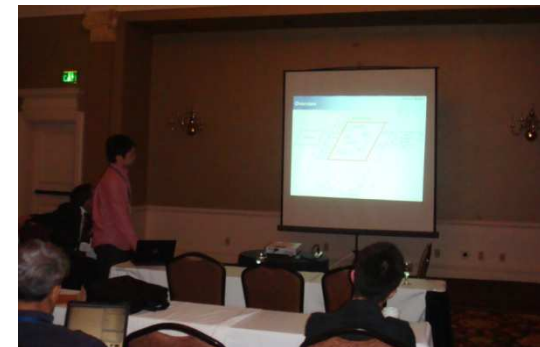
- CIBCB Keynote lecture
- ALIFE Keynote lecture 2
- ADPRL Keynote lecture
- RiISS 세션 발표 몇 편





발표

- **발표 논문:** Robotic intelligence with behavior selection network for Bayesian network ensemble
- **발표는 준비가 좀 부족했지만 무난히 마침**
- **질문**
 - Q. 베이지안 네트워크는 어떻게 설계? A. 사람이 ...
 - Q. 구조는 환경 변화에 따라 어떻게 달라지나? A. 달라지지 않는다.
 - Q. 그럼 obstacle이 나타나면 어떻게 하나? A. 오피스 환경을 가정하고, 가능한 obstacle은 미리 설계시 고려된다.
 - Q. 미리 알고 있다면 그게 무슨 obstacle인가? A. ...
- **준비가 중요하다는 것을 다시 한 번 느낌**





학회 참석 팁

- Keynote speech, keynote lecture, invited talk
 - 잘 알고 있는 분야의 경우 그 분야의 대가가 와서 발표를 하는 경우가 많으므로 도움이 되는 경우가 많음
- Tutorial
 - 최근 연구 결과나 난해한 내용보다 주로 해당 분야의 기본적인 연구 주제 가운데 한 가지를 체계적으로 설명해 주는 경우가 많으므로, 익숙하지 않지만 관심이 있는 분야의 경우에 도움이 많이 됨
- 학회 발표
 - 관련성이 크며 좋은 내용의 발표를 찾기가 매우 어려움
 - 그보다는 다양한 분야의 새로운 아이디어를 접하는 데에 도움이 됨
 - 프로그램을 통해 알아보고 관심이 가는 발표의 경우 미리 내용을 알아두면 좋음





- **전문연구요원 국외여행 허가 신청**
 - 귀국 예정일은 넉넉히 잡아야 할 듯 (특히 경유가 많을 때)
- **미국 여행시**
 - 전자여권이 있을 경우 단기간이면 비자 필요 없음
 - 대신 인터넷으로 ESTA에서 허가신청 받을 것
 - 오래 걸릴 수도 있다고 하는데, 별 문제 없으면 몇 가지 항목에 답변만 달면 바로 허가
 - 허가가 나와도 입국거부 될 수도 있다는데, 학회 참석의 경우 쉽게 허가되는 듯 (질문: 한국에서 뭐하냐? 미국은 왜 왔냐? 학회는 뭐에 대한 것이냐? 등 기본적인 내용들)
- **실전 영어**
 - 지식 + 눈치 + 적극성
 - 나머지 단기간에 향상되기 어려우므로 적극성이 중요

