

Stanford



Jure Leskovec

Associate Professor of Computer Science

CONTACT INFORMATION

- **Administrator**

Yesenia Gallegos - Administrative Associate

Email ygallegos@cs.stanford.edu

Tel (650) 723-0872

Bio

BIO

Leskovec's research focuses on the analyzing and modeling of large social and information networks as the study of phenomena across the social, technological, and natural worlds. He focuses on statistical modeling of network structure, network evolution, and spread of information, influence and viruses over networks. Problems he investigates are motivated by large scale data, the Web and other on-line media. He also does work on text mining and applications of machine learning.

ACADEMIC APPOINTMENTS

- Associate Professor, Computer Science
- Member, Bio-X
- Member, Stanford Neurosciences Institute

PROFESSIONAL EDUCATION

- BSc, University of Ljubljana, Sloveni , Computer Science (2004)
- PhD, Carnegie Mellon University , Computer Science (2008)

LINKS

- My Personal Site: <http://cs.stanford.edu/~jure/>

Teaching

COURSES

2017-18

- Analysis of Networks: CS 224W (Aut)
- Mining Massive Data Sets: CS 246 (Win)
- Mining Massive Data Sets Hadoop Lab: CS 246H (Win)
- Project in Mining Massive Data Sets: CS 341 (Spr)

2016-17

- Mining Massive Data Sets: CS 246 (Win)
- Project in Mining Massive Data Sets: CS 341 (Spr)
- Social and Information Network Analysis: CS 224W (Aut)

2014-15

- Information and Data Analytics Seminar: CS 545 (Win)
- Mining Massive Data Sets: CS 246 (Win)
- Mining Massive Data Sets Hadoop Lab: CS 246H (Win)
- Social and Information Networks: CS 224W (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Maulik Kamdar

Postdoctoral Faculty Sponsor

Michele Catasta, Blaz Fortuna, Srijan Kumar, Baharan Mirzasoleimanbarzi, Robert Palovics, Marinka Zitnik

Doctoral Dissertation Advisor (AC)

Bowen Liu

Doctoral (Program)

Jiaxuan You

Publications

PUBLICATIONS

- **Higher-order clustering in networks** *PHYSICAL REVIEW E*
Yin, H., Benson, A. R., Leskovec, J.
2018; 97 (5)
- **Modeling Individual Cyclic Variation in Human Behavior.** *Proceedings of the ... International World-Wide Web Conference. International WWW Conference*
Pierson, E., Althoff, T., Leskovec, J.
2018; 2018: 107–16
- **Modeling Interdependent and Periodic Real-World Action Sequences.** *Proceedings of the ... International World-Wide Web Conference. International WWW Conference*
Kurashima, T., Althoff, T., Leskovec, J.
2018; 2018: 803–12
- **I'll Be Back: On the Multiple Lives of Users of a Mobile Activity Tracking Application.** *Proceedings of the ... International World-Wide Web Conference. International WWW Conference*
Lin, Z., Althoff, T., Leskovec, J.
2018; 2018: 1501–11
- **HUMAN DECISIONS AND MACHINE PREDICTIONS** *QUARTERLY JOURNAL OF ECONOMICS*
Kleinberg, J., Lakkaraju, H., Leskovec, J., Ludwig, J., Mullainathan, S.
2018; 133 (1): 237–93
- **Large-scale analysis of disease pathways in the human interactome.** *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*
Agrawal, M., Zitnik, M., Leskovec, J.
2018; 23: 111–22
- **The Selective Labels Problem: Evaluating Algorithmic Predictions in the Presence of Unobservables.** *KDD : proceedings. International Conference on Knowledge Discovery & Data Mining*

-
- Lakkaraju, H., Kleinberg, J., Leskovec, J., Ludwig, J., Mullainathan, S.
2017; 2017: 275–84
- **Toeplitz Inverse Covariance-Based Clustering of Multivariate Time Series Data.** *KDD : proceedings. International Conference on Knowledge Discovery & Data Mining*
Hallac, D., Vare, S., Boyd, S., Leskovec, J.
2017; 2017: 215–23
 - **Network Inference via the Time-Varying Graphical Lasso.** *KDD : proceedings. International Conference on Knowledge Discovery & Data Mining*
Hallac, D., Park, Y., Boyd, S., Leskovec, J.
2017; 2017: 205–13
 - **Local Higher-Order Graph Clustering.** *KDD : proceedings. International Conference on Knowledge Discovery & Data Mining*
Yin, H., Benson, A. R., Leskovec, J., Gleich, D. F.
2017; 2017: 555–64
 - **Large-scale physical activity data reveal worldwide activity inequality** *NATURE*
Althoff, T., Sosis, R., Hicks, J. L., King, A. C., Delp, S. L., Leskovec, J.
2017; 547 (7663): 336+
 - **Network analysis: a novel method for mapping neonatal acute transport patterns in California.** *Journal of perinatology*
Kunz, S. N., Zupancic, J. A., Rigdon, J., Phibbs, C. S., Lee, H. C., Gould, J. B., Leskovec, J., Profit, J.
2017; 37 (6): 702-708
 - **Loyalty in Online Communities.** *Proceedings of the ... International AAAI Conference on Weblogs and Social Media. International AAAI Conference on Weblogs and Social Media*
Hamilton, W. L., Zhang, J., Danescu-Niculescu-Mizil, C., Jurafsky, D., Leskovec, J.
2017; 2017: 540–43
 - **Online Actions with Offline Impact: How Online Social Networks Influence Online and Offline User Behavior.** *Proceedings of the ... International Conference on Web Search & Data Mining. International Conference on Web Search & Data Mining*
Althoff, T., Jindal, P., Leskovec, J.
2017; 2017: 537-546
 - **SnapVX: A Network-Based Convex Optimization Solver** *JOURNAL OF MACHINE LEARNING RESEARCH*
Hallac, D., Wong, C., Diamond, S., Sharang, A., Sosis, R., Boyd, S., Leskovec, J.
2017; 18
 - **SnapVX: A Network-Based Convex Optimization Solver.** *Journal of machine learning research : JMLR*
Hallac, D., Wong, C., Diamond, S., Sharang, A., Sosis, R., Boyd, S., Leskovec, J.
2017; 18 (1): 110–14
 - **Large-scale Graph Representation Learning**
Leskovec, J., Nie, J. Y., Obradovic, Z., Suzumura, T., Ghosh, R., Nambiar, R., Wang, C., Zang, H., BaezaYates, R., Hu, Kepner, J., Cuzzocrea, A., Tang, J., et al
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 - **Mining Big Data to Extract Patterns and Predict Real-Life Outcomes** *PSYCHOLOGICAL METHODS*
Kosinski, M., Wang, Y., Lakkaraju, H., Leskovec, J.
2016; 21 (4): 493-506
 - **Cultural Shift or Linguistic Drift? Comparing Two Computational Measures of Semantic Change.** *Proceedings of the Conference on Empirical Methods in Natural Language Processing. Conference on Empirical Methods in Natural Language Processing*
Hamilton, W. L., Leskovec, J., Jurafsky, D.
2016; 2016: 2116-2121
 - **SNAP: A General-Purpose Network Analysis and Graph-Mining Library** *ACM TRANSACTIONS ON INTELLIGENT SYSTEMS AND TECHNOLOGY*
Leskovec, J., Sosis, R.
2016; 8 (1)
 - **node2vec: Scalable Feature Learning for Networks.** *KDD : proceedings. International Conference on Knowledge Discovery & Data Mining*
Grover, A., Leskovec, J.

2016; 2016: 855-864

- **Higher-order organization of complex networks** *SCIENCE*
Benson, A. R., Gleich, D. F., Leskovec, J.
2016; 353 (6295): 163-166
- **Growing Wikipedia Across Languages via Recommendation.** *Proceedings of the ... International World-Wide Web Conference. International WWW Conference*
Wulczyn, E., West, R., Zia, L., Leskovec, J.
2016; 2016: 975-985
- **Large-scale Analysis of Counseling Conversations: An Application of Natural Language Processing to Mental Health.** *Transactions of the Association for Computational Linguistics*
Althoff, T., Clark, K., Leskovec, J.
2016; 4: 463-476
- **Information Cartography** *COMMUNICATIONS OF THE ACM*
Shahaf, D., Guestrin, C., Horvitz, E., Leskovec, J.
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- **The mobilize center: an NIH big data to knowledge center to advance human movement research and improve mobility.** *Journal of the American Medical Informatics Association*
Ku, J. P., Hicks, J. L., Hastie, T., Leskovec, J., Ré, C., Delp, S. L.
2015; 22 (6): 1120-1125
- **Network Lasso: Clustering and Optimization in Large Graphs.** *KDD : proceedings. International Conference on Knowledge Discovery & Data Mining*
Hallac, D., Leskovec, J., Boyd, S.
2015; 2015: 387-396
- **Donor Retention in Online Crowdfunding Communities: A Case Study of DonorsChoose.org.** *Proceedings of the ... International World-Wide Web Conference. International WWW Conference*
Althoff, T., Leskovec, J.
2015; 2015: 34-44
- **Ringo: Interactive Graph Analytics on Big-Memory Machines.** *Proceedings. ACM-Sigmod International Conference on Management of Data*
Perez, Y., Susic, R., Banerjee, A., Puttagunta, R., Raison, M., Shah, P., Leskovec, J.
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- **Defining and evaluating network communities based on ground-truth** *KNOWLEDGE AND INFORMATION SYSTEMS*
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2015; 2015: 118-126
- **Mining Missing Hyperlinks from Human Navigation Traces: A Case Study of Wikipedia.** *Proceedings of the ... International World-Wide Web Conference. International WWW Conference*
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- **Overlapping Communities Explain Core-Periphery Organization of Networks** *PROCEEDINGS OF THE IEEE*
Yang, J., Leskovec, J.
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- **Structure and Overlaps of Ground-Truth Communities in Networks** *ACM TRANSACTIONS ON INTELLIGENT SYSTEMS AND TECHNOLOGY*

- Yang, J., Leskovec, J.
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- **Discovering Social Circles in Ego Networks** *ACM TRANSACTIONS ON KNOWLEDGE DISCOVERY FROM DATA*
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 - **Modeling Information Propagation with Survival Theory**
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 - **Community Detection in Networks with Node Attributes** *IEEE 13th International Conference on Data Mining (ICDM)*
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 - **Structure and Dynamics of Information Pathways in Online Media**
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 - **Nonparametric Multi-group Membership Model for Dynamic Networks**
Kim, M., Leskovec, J.
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 - **From Amateurs to Connoisseurs: Modeling the Evolution of User Expertise through Online Reviews**
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 - **Hidden Factors and Hidden Topics: Understanding Rating Dimensions with Review Text**
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 - **NIFTY: A System for Large Scale Information Flow Tracking and Clustering**
Suen, C., Huang, S., Eksombatchai, C., Sosc, R., Leskovec, J.
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 - **Steering User Behavior With Badges**
Anderson, A., Huttenlocher, D., Kleinberg, J., Leskovec, J.
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 - **Overlapping Community Detection at Scale: A Nonnegative Matrix Factorization Approach**
Yang, J., Leskovec, J.
2013
 - **Information Cartography: Creating Zoomable, Large-Scale Maps of Information**
Shahaf, D., Yang, J., Suen, C., Jacobs, J., Wang, H., Leskovec, J.
2013
 - **Community Detection in Networks with Node Attributes**
Yang, J., McAuley, J., Leskovec, J.
2013
 - **A computational approach to politeness with application to social factors**
Danescu-Niculescu-Mizil, C., Sudhof, M., Jurafsky, D., Leskovec, J., Potts, C.
2013
 - **No Country for Old Members: User lifecycle and linguistic change in online communities**
Danescu-Niculescu-Mizil, C., West, R., Jurafsky, D., Leskovec, J., Potts, C.
2013
 - **What's in a name? Understanding the Interplay between Titles, Content, and Communities in Social Media**
Lakkaraju, H., McAuley, J., Leskovec, J.

2013

- **Measurement error in network data: A re-classification** *SOCIAL NETWORKS*
Wang, D. J., Shi, X., McFarland, D. A., Leskovec, J.
2012; 34 (4): 396-409
- **Inferring Networks of Diffusion and Influence** *ACM TRANSACTIONS ON KNOWLEDGE DISCOVERY FROM DATA*
Gomez-Rodriguez, M., Leskovec, J., Krause, A.
2012; 5 (4)
- **Community-Affiliation Graph Model for Overlapping Network Community Detection** *12th IEEE International Conference on Data Mining (ICDM)*
Yang, J., Leskovec, J.
IEEE.2012: 1170–1175
- **Image Labeling on a Network: Using Social-Network Metadata for Image Classification** *12th European Conference on Computer Vision (ECCV)*
McAuley, J., Leskovec, J.
SPRINGER-VERLAG BERLIN.2012: 828–841
- **Learning to Discover Social Circles in Ego Networks**
McAuley, J., Leskovec, J.
2012
- **Latent Multi-group Membership Graph Model**
Kim, M., Leskovec, J.
2012
- **Information Diffusion and External Influence in Networks**
Myers, S., Zhu, C., Leskovec, J.
2012
- **Learning Attitudes and Attributes from Multi-Aspect Reviews**
McAuley, J., Leskovec, J., Jurafsky, D.
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- **Automatic versus Human Navigation in Information Networks**
West, R., Leskovec, J.
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- **Discovering Value from Community Activity on Focused Question Answering Sites: A Case Study of Stack Overflow**
Anderson, A., Huttenlocher, D., Kleinberg, J., Leskovec, J.
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- **The Life and Death of Online Groups: Predicting Group Growth and Longevity**
Kairam, S., Wang, D., Leskovec, J.
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- **Human Wayfinding in Information Networks**
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- **Effects of User Similarity in Social Media**
Anderson, A., Huttenlocher, D., Kleinberg, J., Leskovec, J.
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- **Defining and Evaluating Network Communities based on Ground-truth** *12th IEEE International Conference on Data Mining (ICDM)*
Yang, J., Leskovec, J.

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- **Clash of the Contagions: Cooperation and Competition in Information Diffusion** *12th IEEE International Conference on Data Mining (ICDM)*
Myers, S. A., Leskovec, J.
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- **HADI: Mining Radii of Large Graphs** *ACM TRANSACTIONS ON KNOWLEDGE DISCOVERY FROM DATA*
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2011; 5 (2)
- **Large-Scale Web Data Analysis** *IEEE INTELLIGENT SYSTEMS*
Leskovec, J.
2011; 26 (1): 11-11
- **Sentiment Flow Through Hyperlink Networks**
Miller, M., Sathi, C., Wiesenthal, D., Leskovec, J., Potts, C.
2011
- **Modeling Social Networks with Node Attributes using the Multiplicative Attribute Graph Model**
Kim, M., Leskovec, J.
2011
- **Dynamics of Bidding in a P2P Lending Service: Effects of Herding and Predicting Loan Success**
Ceyhan, S., Shi, X., Leskovec, J.
2011
- **The Network Completion Problem: Inferring Missing Nodes and Edges in Networks**
Kim, M., Leskovec, J.
2011
- **Patterns of Temporal Variation in Online Media**
Yang, J., Leskovec, J.
2011
- **The Role of Social Networks in Online Shopping: Information Passing, Price of Trust, and Consumer Choice**
Guo, S., Wang, M., Leskovec, J.
2011
- **Supervised Random Walks: Predicting and Recommending Links in Social Networks**
Backstrom, L., Leskovec, J.
2011
- **Friendship and Mobility: User Movement In Location-Based Social Networks**
Cho, E., Myers, S., A., Leskovec, J.
2011
- **Correcting for Missing Data in Information Cascades**
Sadikov, E., Medina, M., Leskovec, J., Garcia-Molina, H.
2011
- **Kronecker Graphs: An Approach to Modeling Networks** *JOURNAL OF MACHINE LEARNING RESEARCH*
Leskovec, J., Chakrabarti, D., Kleinberg, J., Faloutsos, C., Ghahramani, Z.
2010; 11: 985-1042
- **Multiplicative Attribute Graph Model of Real-World Networks** *7th Workshop on Algorithms and Models for the Web Graph*
Kim, M., Leskovec, J.
SPRINGER-VERLAG BERLIN.2010: 62–73
- **Predicting Positive and Negative Links in Online Social Networks**
Leskovec, J., Huttenlocher, D., Kleinberg, J.

2010

- **Citing for High Impact**

Shi, X., Leskovec, J., McFarland, D., A.

2010

- **Modeling Information Diffusion in Implicit Networks**

Yang, J., Leskovec, J.

2010

- **Empirical Comparison of Algorithms for Network Community Detection**

Leskovec, J., Lang, K., Mahoney, M.

2010

- **On the Convexity of Latent Social Network Inference**

Myers, S., A., Leskovec, J.

2010

- **Radius Plots for Mining Tera-byte Scale Graphs: Algorithms, Patterns, and Observations**

Kang, U., Tsourakakis, C., Appel, A., Faloutsos, C., Leskovec, J.

2010

- **Governance in Social Media: A case study of the Wikipedia promotion process**

Leskovec, J., Huttenlocher, D., Kleinberg, J.

2010

- **Signed Networks in Social Media** *28th Annual CHI Conference on Human Factors in Computing Systems*

Leskovec, J., Huttenlocher, D., Kleinberg, J.

ASSOC COMPUTING MACHINERY.2010: 1361–1370

- **Meme-tracking and the Dynamics of the News Cycle** *15th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*

Leskovec, J., Backstrom, L., Kleinberg, J.

ASSOC COMPUTING MACHINERY.2009: 497–505

- **Community Structure in Large Networks: Natural Cluster Sizes and the Absence of Large Well-Defined Clusters** *Internet Mathematics*

Leskovec, J., Lang, K., Dasgupta, A., Mahoney, M.

2009; 1 (6): 29–123

- **Modeling blog dynamics**

Goetz, M., Leskovec, J., Mcglohon, M., Faloutsos, C.

2009

- **The Battle of the Water Sensor Networks (BWSN): A Design Challenge for Engineers and Algorithms**

Leskovec, J., Ostfeld et al, A.

2009

- **Efficient Sensor Placement Optimization for Securing Large Water Distribution Networks** *JOURNAL OF WATER RESOURCES PLANNING AND MANAGEMENT-ASCE*

Krause, A., Leskovec, J., Guestrin, C., VanBriesen, J., Faloutsos, C.

2008; 134 (6): 516-526

- **Mobile Call Graphs: Beyond Power-Law and Lognormal Distributions**

Seshadri, M., Machiraju, S., Sridharan, A., Bolot, J., Faloutsos, C., Leskovec, J.

2008

- **Planetary-Scale Views on a Large Instant-Messaging Network**

Leskovec, J., Horvitz, E.

2008

- **Epidemic Thresholds in Real Networks**

Chakrabarti, D., Wang, Y., Wang, C., Leskovec, J., Faloutsos, C.

2008

- **Statistical Properties of Community Structure in Large Social and Information Networks**

Leskovec, J., Lang, K., Dasgupta, A., Mahoney, M.

2008

- **Microscopic Evolution of Social Networks**

Leskovec, J., Backstrom, L., Kumar, R., Tomkins, A.

2008

- **Monitoring Network Evolution using MDL**

Ferlez, J., Faloutsos, C., Leskovec, J., Mladenic, D., Grobelnik, M.

2008

- **Cost-effective Outbreak Detection in Networks**

Leskovec, J., Krause, A., Guestrin, C., Faloutsos, C., VanBriesen, J., Glance, N.

2007

- **Web Projections: Learning from Contextual Subgraphs of the Web**

Leskovec, J., Dumais, S., Horvitz, E.

2007

- **Scalable Modeling of Real Graphs using Kronecker Multiplication**

Leskovec, J., Faloutsos, C.

2007

- **The Dynamics of Viral Marketing** *ACM Transactions on the Web (TWEB)*

Leskovec, J., Adamic, L., Huberman, B.

2007; 1 (1)

- **Graph Evolution: Densification and Shrinking Diameters**

Leskovec, J., Kleinberg, J., Faloutsos, C.

2007

- **Cascading Behavior in Large Blog Graphs**

Leskovec, J., McGlohon, M., Faloutsos, C., Glance, N., Hurst, M.

2007

- **Information Survival Threshold in Sensor and P2P Networks**

Chakrabarti, D., Leskovec, J., Faloutsos, C., Madden, S., Guestrin, C., Faloutsos, M.

2007

- **Sampling from Large Graphs**

Leskovec, J., Faloutsos, C.

2006

- **Data Association for Topic Intensity Tracking**

Krause, A., Leskovec, J., Guestrin, C.

2006

- **The Dynamics of Viral Marketing**

Leskovec, J., Adamic, L., Huberman, B.

2006

- **Patterns of Influence in a Recommendation Network**

Leskovec, J., Singh, A., Kleinberg, J.

2006

- **Realistic, mathematically tractable graph generation and evolution, using Kronecker multiplication** *16th European Conference on Machine Learning (ECML)/9th European Conference on Principles and Practice of Knowledge Discovery in Databases (PKDD)*

Leskovec, J., Chakrabarti, D., Kleinberg, J., Faloutsos, C.

SPRINGER-VERLAG BERLIN, 2005: 133–145

- **Semantic Text Features from Small World Graphs**
Leskovec, J., Shawe-Taylor, J.
2005
- **Impact of Linguistic Analysis on the Semantic Graph Coverage and Learning of Document Extracts**
Leskovec, J., Milic-Frayling, N., Grobelnik, M.
2005
- **Graphs over Time: Densification Laws, Shrinking Diameters and Possible Explanations**
Leskovec, J., Kleinberg, J., Faloutsos, C.
2005
- **Extracting Summary Sentences Based on the Document Semantic Graph** *Microsoft Research Technical Report MSR-TR-2005-07*
Leskovec, J., Milic-Frayling, N., Grobelnik, M.
2005
- **Learning Sub-structures of Document Semantic Graphs for Document Summarization**
Leskovec, J., Grobelnik, M., Milic-Frayling, N.
2004
- **The Download Estimation task on KDD Cup 2003** *SIGKDD Explorations*
Brank, J., Leskovec, J.
2003
- **Linear Programming boost for Uneven Datasets**
Leskovec, J., Shawe-Taylor, J.
2003
- **KDD Cup 2003: The Download Estimation task** *Jozef Stefan Institute Technical Report*
Brank, J., Leskovec, J.
2003
- **Govorec - sistem za slovensko govorjenje racunalniskih besedil** *Information Society*
Leskovec, J.
2001
- **Detection of Human Bodies using Computer Analysis of a Sequence of Stereo Images**
Leskovec, J.
1999