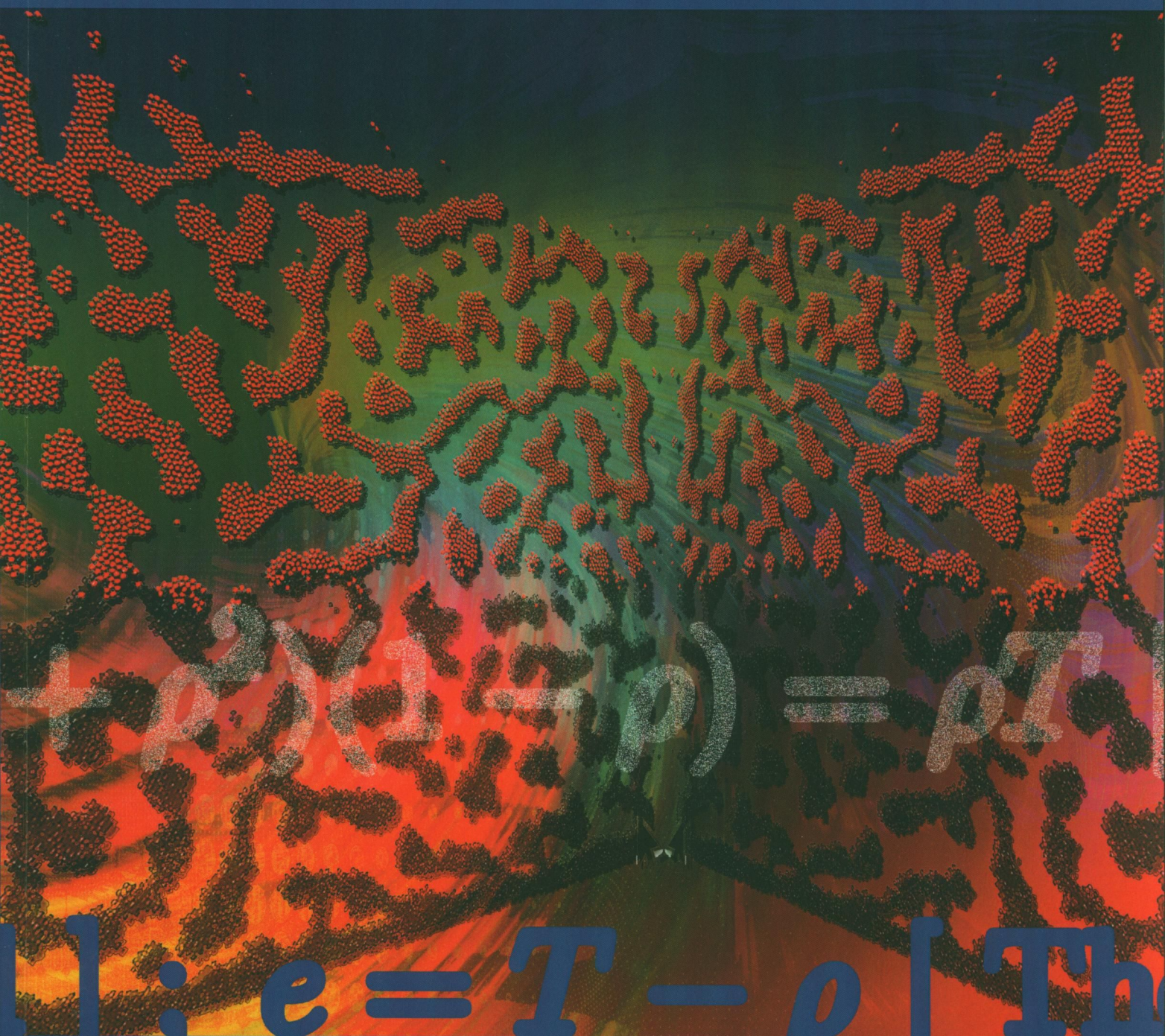


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1. WHAT IS LIQUID? [IN TWO DIMENSIONS]

This work had its origin in the recent death of our colleague Douglas Henderson at 51. Bill's friendship with Doug began back in the 1960s, their early years as students working at the Lawrence Livermore Radiation Laboratory (LLNL) and IBM's Almaden Research Center in San Jose (CA). William and Carol visited Doug and RoseMarie's home in San Francisco and, after the 1980s, their family.

of 17 October 1989, in Santa Cruz. These were becoming more frequent following the Hovers' move to Ruby Valley Nevada in 2005.

All four of us authors have carried out research work devoted to a longstanding challenge of equilibrium statistical mechanics, a better understanding of liquid state structure. The Mayer, Kirkwood, Fröhlich and the Onsager and De Groot models for ordered solids provide a relatively accurate understanding of matter's simplest pair of phases: Liquids

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Automatic Speech Recognition and its Application to Media Monitoring

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1. INTRODUCTION

Automatic speech recognition (ASR) methods have been under development for several decades now. The initial success was achieved with an application of statistical modeling with Hidden Markov Models (HMM). In this approach machine learning algorithms are used to build models based on training data in order to process and identify the speech signal. HMMs contain various types of information such as semantics, language and syntax in one probabilistic system.

The speech signal is a result of many mental and physical processes and as such is characterized by large variability which has intra-personal and inter-personal sources. Therefore, a large training set is necessary to build proper statistical models. A model dedicated to a certain type of speech, e.g. speech of a certain age group, can often capture the nature of the speech signal better than a more general model. Typically an area of ASR application determines the type of speech to be recognized and its acoustic properties.

The HMM-based approach dominated till late 1990s when it became obvious that it is not sufficient for more challenging cases such as processing spontaneous speech

recorded in a noisy environment with many speakers' voices overlapping or for processing the audio signal which is not available for a human. Deep learning methods are gradually taking over various aspects of the speech recognition process.

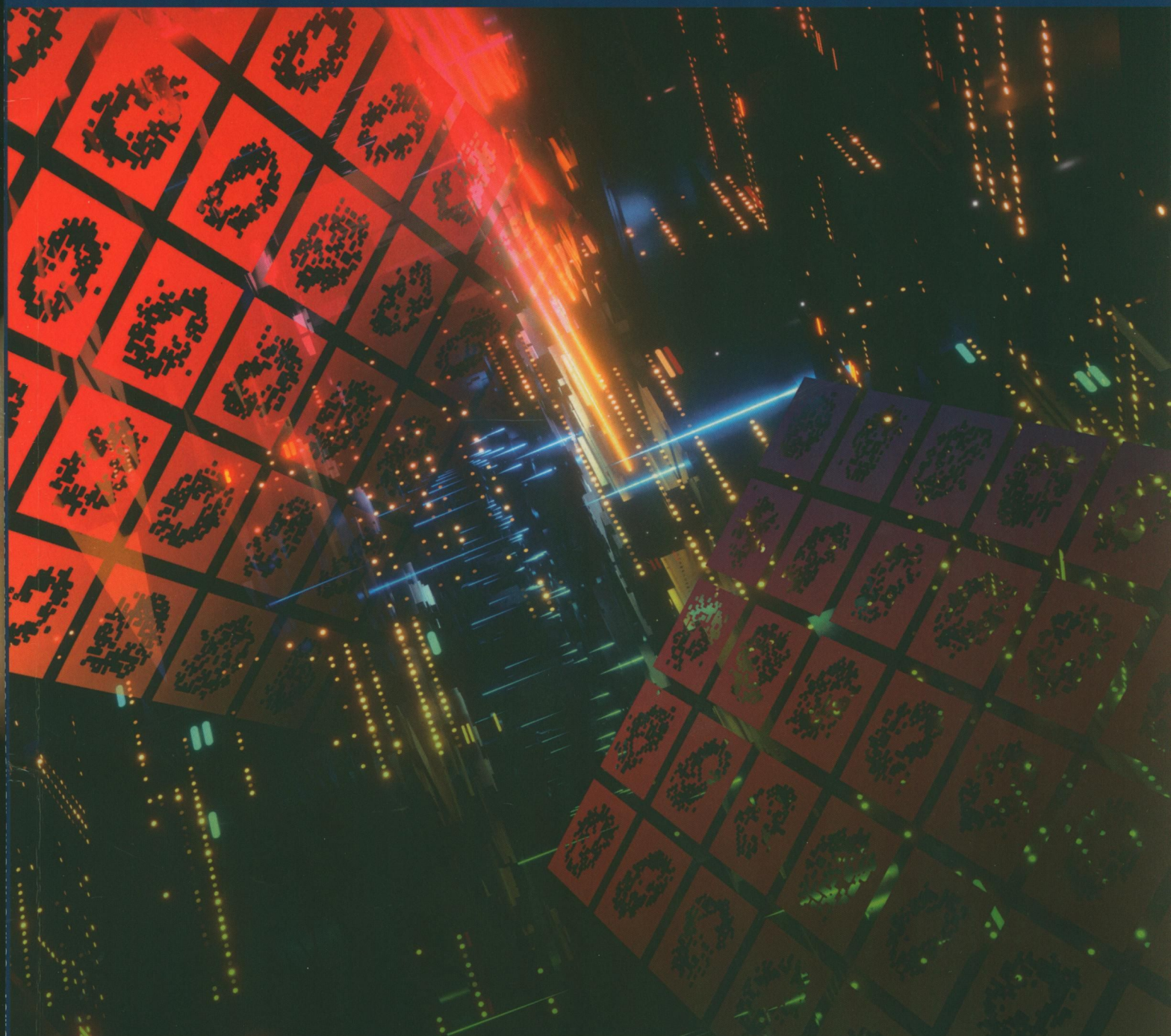
In this paper we present ARM-1 engine [1, 2] developed for speech recognition of the Polish language and its application in one area that can be particularly demanding, namely media monitoring. We are faced with rapid development of information technology. Information can be easily created and distributed, which results in a constantly growing amount of information available in the media and increased dynamics of its spread. Therefore, automation of media content processing and analysis performed in various media monitoring areas is necessary to deal with the sheer volume of content and its diversity. Another area that could benefit from automatic content analysis is digital humanities [3] as a discipline relying on advanced computational methods and experiencing dynamic growth with increasing availability of various tools and services.

As already mentioned, ASR task becomes more challenging when we deal with spontaneous speech recorded

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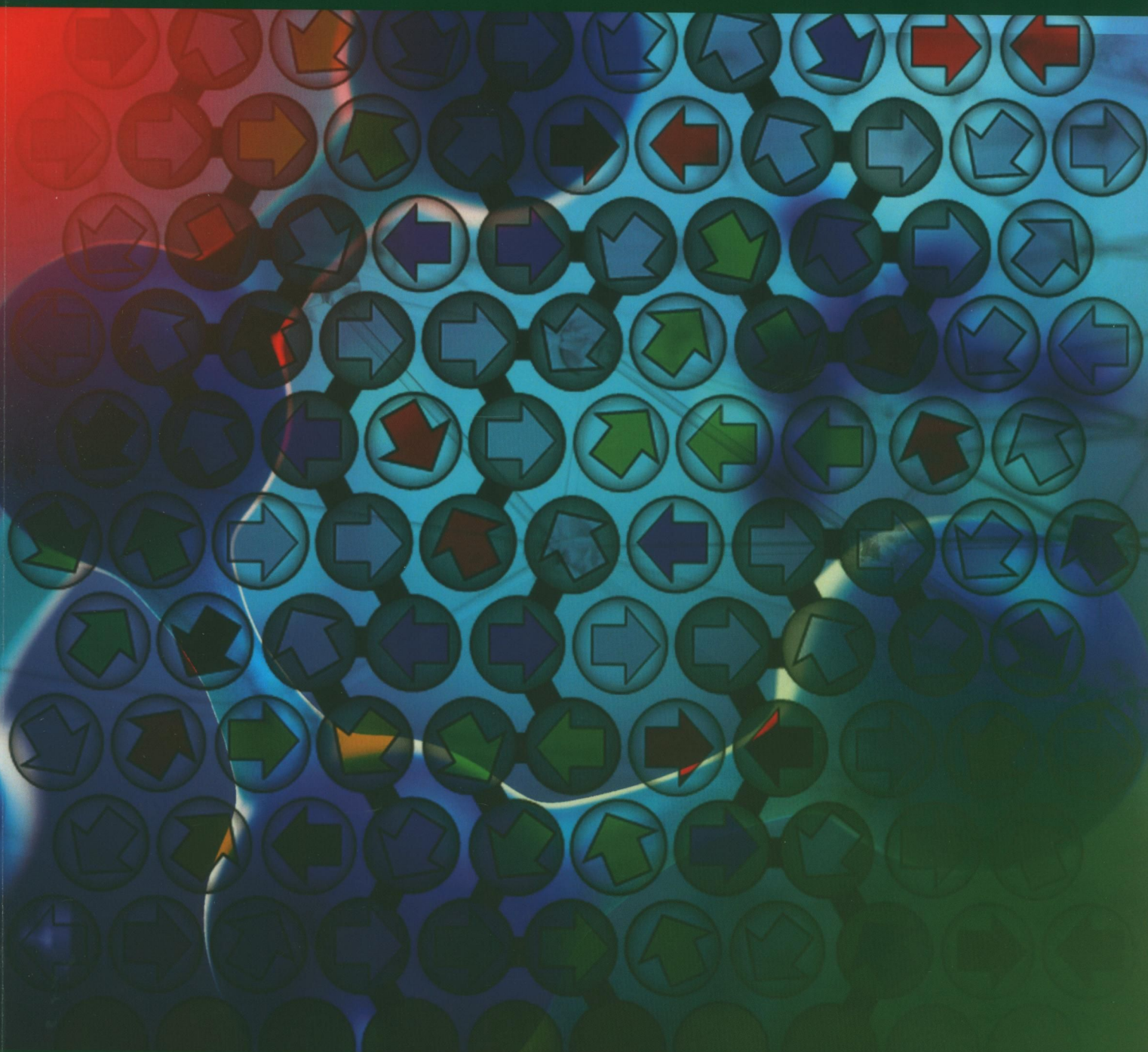
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Computer Simulation of Dynamic Behavior of Double Polymer Brush-Solvent Systems

K. Hałagan¹, M. Banaszak^{2,3}, J. Jung⁴, P. Polanowski¹, A. Sikorski¹

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Combined Probabilistic Methods for Droplet Drying Simulations

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Abstract. We study the dynamics of double polymer brush-solvent systems. The dynamic properties of these systems were studied by means of Monte Carlo simulations. The Dynamic Lattice Model and a highly efficient parallel machine ARIZ were employed, which enabled studying large systems at long time scales. The influence of the surface-grafting density on the system dynamics was studied and discussed. It was demonstrated that the self-diffusion coefficient of a solvent depended strongly on the grafting density.

Key words: dynamic lattice model, lattice models, Monte Carlo method, polymer brushes, polymer dynamics.

1. INTRODUCTION

Polymer brushes are built of chains terminally attached to a surface. Brushes were the subject of various experimental techniques of synthesizing, as recently reviewed [1–5]. They were also studied theoretically but owing to their complexity many questions are still not fully answered [1–5].

Understanding the factors that influence the properties of brushes is therefore important for designing novel and intelligent polymeric systems [6]. The properties of brushes were studied by means of Molecular Dynamics and Dissipative Particle Dynamics [7–9], Monte Carlo simulations [10, 10–18], scaling theory, and self-consistent field theoretical considerations [17, 19–22].