



DEPARTMENT OF PHYSICS

February 5, 2004

Biocomplexity Search Committee  
Prof. Rob de Ruyter van Stevenick  
Indiana University  
Biocomplexity Institute  
Swain Hall West 117  
Bloomington, IN 47405-7105

To Whom It May Concern:

It is a pleasure to write a letter of recommendation for Dr. Radu Dobrin, who is applying for a position in your Institution. I met Radu at the Dynamical Networks in Complex Systems meeting in July 2001, Kiel Germany, at which we had several interesting discussions about his work on spanning trees, a subject that was one of my interests. At that point he was still a graduate student, but quite well versed in statistical mechanics. His subsequent PhD thesis on depinning, self-organized criticality and roughening transition was quite innovative, finding that the geometry of the minimum spanning trees in disordered systems is universal, independent of the details of the randomness. He successfully brought together a series of techniques, from spin glasses to surface growth phenomena, exploiting them to offer a coherent understanding of minimum spanning trees.

Based on his thesis work, when we had a postdoctoral opening, we interviewed him together with several other candidates, but he was our clear first choice. Radu is now part of an interdisciplinary research program that is directed jointly by Dr. Oltvai from Northwestern University and myself. He works in the Northwestern part of the group, being in direct contact with the experimental team. I meet with him about every second week and we communicate frequently.

Radu's current research focuses on the analysis of the system-level behavior of transcriptional, metabolic and protein-protein interaction networks. In the past year there has been increased interest in trying to locate statistically overrepresented subgraphs in real networks. Radu, after spending some time familiarizing himself with the project, has come to an interesting finding: the motifs do not represent independent and isolated entities, but they coalesce to form motif clusters. This was a quite unexpected observation, most analysis focusing on the functional properties of the motifs have assumed that motifs can be studied independently from each other. His finding was recently in BMC Bioinformatics, a prominent bioinformatics journal.

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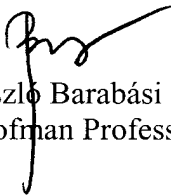
225 Nieuwland Science Hall  
Notre Dame, Indiana 46556-5670 USA  
*Telephone* (574) 631-5767 \* *Facsimile* (574) 631-5952  
*E-mail* alb@nd.edu \* *Web site* <http://www.nd.edu/~networks/>

Dr. Radu Dobrin  
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He is currently working with a postdoc of mine, Alexei Vazquez on developing a general theory of motif clusters. The results of these investigations are quite interesting, as they have been able to show that in fact all motif clusters can be derived from the network's large-scale topology. I think that this work amounts to a highly general theory of motif in biological, and we hope to submit a paper on the results in about a month.

Radu has acquired considerably experience in both network theory and biology, and uses his knowledge in a creative manner. He is very reliable, and gets quite nice and clean results. His strong background in soft condensed matter from disordered systems to statistical mechanics and systems biology/bioinformatics makes him a suitable candidate in an interdisciplinary field in which there are very few experts. He is a very nice and friendly person, and he can easily work with other people in a group or a department. I recommend him highly in your attention.

Sincerely,

A handwritten signature in black ink, appearing to be 'Al Barabási', written over the printed name.

Albert-László Barabási  
Emil T. Hofman Professor of Physics