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**To:** The Department of Computer Engineering and Informatics

University of Patras, Greece

Dear Colleagues:

I am writing to give you my opinion on **Professor Ioannis Caragiannis**, whom you are considering for promotion to the rank of Associate Professor. I do not know him personally very well, as we have only met him casually at scientific meetings over the years, but I have followed some of his work. I believe I can give you a useful assessment.

Caragiannis works in Theoretical Computer Science, and in particular on the analysis of algorithms, typically arising in the context of parallel systems, networks, and markets – in fact, his research interests and results seem to have followed this precise trajectory, moving over two decades from parallelism to networks to the field known as algorithmic game theory. His work is very extensive, and in fact he has been extremely active the past few years. He collaborates extensively, with researchers who are both more junior and more senior than him, and almost all of his papers have a long list of contributors. This is very common in this field, and it is never a problem in scholarly assessments, as continuity of contribution can be evident from an extensive opus with a changing cast of collaborators; below by "he" I mean of course "he and co-authors."

I know some of his results quite well. He has done extensive and powerful work in the area of the "price of anarchy" (loss of efficiency due to the participants' conflicting objectives) in congestion games, especially in the load-balancing problem for specialized servers. He has written a very interesting paper on the so-called generalized second price auction, a protocol that has become a standard in the on-line advertising industry despite its feeble theoretical basis. Many works have been written to justify this auction ex post, and this paper is among the most informative and interesting, establishing as it does that the worst-case loss of efficiency is quite limited. He has even done some work in complexity, improving a result of mine (with George Pierrakos) on the inapproximability of the optimum auction when the valuations of the bidders are correlated; I have read this paper carefully, and I was impressed with its depth of understanding of our ideas and the cleverness of the improvement (we had tried rather hard). Finally, he has done some

interesting algorithmic work in the field of social choice (how should a group arrive at decisions).

Caragiannis publishes very extensively, and occasionally in very high quality venues – he has papers in FOCS and SODA, two extremely selective conferences, and many papers in the EC conference, the premier venue for algorithmic game theory work. Incidentally, as you probably know, in Professor Caragiannis's field conferences are much more important, and usually even more prestigious, than journals; but I see that he has many papers in journals as well. In terms of comparisons, this is a very exciting field that has attracted many clever young people, but Caragiannis's record compares very well even in this competition. In terms of others aspects of scholarly work, I believe that I have not heard him speak, but I see that he writes well and that he is very engaged with student supervision, and I have seen course surveys indicating that students appreciate his teaching. I believe that his overall profile is well above what would be considered adequate basis for promotion to Associate in an excellent department in the US.

As many of you know, I have deep respect for, and lifelong fond ties with, your department and university. It is in this context that I am supporting the advancement of Professor Caragiannis to the rank of Associate Professor.

Sincerely,

Christos Papadimitriou
C. Lester Hogan Professor
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