



COLLEGE OF NATURAL SCIENCES

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To Whom It May Concern:

I am very pleased to recommend Srinivas Nedunuri. Srinivas is self-driven and very organized. He is able to complete complex tasks that involve many steps and where he has to work out the plan. He is proficient in English, having grown up in the UK and United States. He is friendly, knowledgeable and very willing to be helpful.

Srinivas is a PhD student in my group working on guided synthesis of greedy algorithms, with applications to planning and scheduling problems. His goal is to build reliable and efficient algorithms by transforming high-level specifications to executable code by weaving the specifications with high-level algorithmic theories that encapsulate sophisticated algorithmic techniques.

I met Srinivas soon after I arrived at UT as an assistant professor. Like me, he has spent significant time in academia and industry. He returned to school to work the problem of synthesizing programs from high-level specifications.

Srinivas's work is focused on algorithm synthesis for greedy algorithms. He is working within the synthesis framework developed by Dr. Doug Smith at Kestrel, but the theories and techniques he has developed have also been applied in other contexts, for example, synthesis of Haskell programs. Srinivas's specific results relate to synthesizing greedy algorithms. Srinivas's key contribution is to formalize the use of *dominance relations* for synthesizing greedy algorithms. A dominance relation indicates when one group of potential solutions *dominates*, or is superior to, another group of potential solutions. Dominance relations are well known in the algorithms community. Srinivas has formalized them within the SpecWare synthesis system and shown that they are a natural technique for deriving very fast algorithms for a fairly wide range of problems. Since 2007 Srinivas has published a series of significant papers where he formalizes his dominance relation technique and applies it to different problems. These include two papers at the NASA Formal Methods Symposium and one paper at the International Conference on Generative Programming and Component Engineering.

More significantly, Srinivas has recently proposed his framework as a new *characterization* for the class of greedy algorithms. Characterization of the class of greedy algorithms is a long-standing unsolved problem. This work is under review at International Colloquium on Theoretical Aspects of Computing.

Srinivas is completing his in the spring of 2012. His committee includes Doug Smith at Kestrel, who is a well-known researcher on program synthesis, including scheduling algorithms. It is worth noting that Srinivas developed his own research topic, rather than being given one by his advisors.

In terms of peers, I would say that Srinivas is on par with Katie Coons, who received a Microsoft Research PhD Fellowship at UT. In terms of creativity, I think that Srinivas is almost as strong as Michael Bond (now a professor at Ohio State), although Michael is working in the more conventional area of dynamic program analysis.

Srinivas has a passion for his topic and an ability to tackle hard problems. He is a creative researcher with good intuition and enough real-world experience to know how to apply his theoretical work to practical problems. The area of program synthesis has historically not the primary focus at top conferences, which makes it challenging to publish papers. Srinivas has had significant success publishing despite this difficulty.

Currently there is a significant shift in programming language research toward more interest and focus on synthesis. I believe that in the long run synthesis will be a more effective approach to building software than traditional verification of low-level code. Srinivas is well positioned to help lead the field during this transition.

Srinivas combines a mature perspective on software with creativity and technical skills that make him an especially effective researcher. He communicates well and is developing well as a writer and presenter. He is doing fundamental research in the increasingly important area of algorithm synthesis.

Sincerely,

A handwritten signature in black ink that reads "William Cook". The signature is written in a cursive, flowing style.

William Cook