Connecticut’s Engineering Gap

China graduates almost four times as many engineers as the United States does. China also offers lucrative tax breaks to companies that conduct research and development there. And China is far from alone: Japan has less than half the population but graduates almost twice as many engineers as the United States. Europe graduates 50 percent more engineers than we do.

With our dwindling numbers of engineering and science graduates, the United States has taken an early lead in the global technological race to the bottom.

How is this relevant to Connecticut?

The U.S. Department of Labor ranks Connecticut, with 10.8 percent of the workforce employed in high technology, second among the most technology-intensive states in the nation. The cumulative payroll of engineers and computer scientists in Connecticut is huge, as are the state and local taxes paid by these individuals and their employers.

But how do we rank among the states in supporting an educational and business infrastructure for technology?

First, the good news. The University of Connecticut educates about 70 percent of all engineering undergraduate students in the state and 60 percent of the graduate engineering students. Since 1998, the UConn School of Engineering has doubled undergraduate engineering enrollments, from 800 to more than 1,600 full-time students. The average SAT of UConn’s engineering students is up by 70 points. The growth is unprecedented nationwide.

Now the bad news.

The Connecticut Business and Industry Association has found that nearly 20 percent of Connecticut manufacturers have “extreme difficulty” in filling engineering vacancies. Some state companies tried without success to fill engineering vacancies for two years. Even with skyrocketing growth in enrollments and as the major supplier of engineering talent to the state, UConn’s School of Engineering cannot fill Connecticut’s demand for engineers.

How did we reach this situation?

Connecticut’s massive economic dependence on the engineering profession dwarfs the state’s puny engineering education infrastructure. Connecticut has 81,250 engineers, architects, computer scientists and mathematicians. UConn has an engineering and computer science faculty size of 105. Statewide, about 240 engineering and computer science faculty are employed in all public and private universities.

How do we stack up?

Alabama employs 65,090 people in architecture, engineering, computer science and math. That state has an engineering faculty of 382 (342 in public universities alone). Kansas has a workforce of 53,320 in those occupations and 264 engineering faculty, all in public universities. Indiana has a workforce of 76,310 and 657 engineering faculty members (391 in public universities alone).

Connecticut is at the bottom in the engineering faculty/workforce ratio. We are often asked why we are not like the engineering programs at the University of Michigan, Illinois or Purdue. Only after tripling our faculty size would UConn’s School of Engineering be of similar size.

The Connecticut General Assembly has not been aggressive in funding emerging technologies and research, an oversight with profound economic implications regionally and nationally.

New York invested more than $125 million in research funds for its state universities from 2000 to 2003. Our neighbor also is investing $250 million to start a college of nanoscale science and engineering in Albany. Ohio’s $1.1 billion Third Frontier Project is funding research in fuel cells and biomedical and other high-tech areas. There are many, many other examples in other states. Unfortunately, Connecticut has not invested in emerging technologies and research at a pace on par with enlightened states.

We are falling behind. Doesn’t it make sense for Connecticut to invest more in emerging technologies and engineering education?

Amir Faghri is dean of the School of Engineering at the University of Connecticut.