

THE SPEECH INSTITUTE

FREQUENTLY ASKED QUESTIONS

What are the long-term goals of the Institute?

The Institute aims to become the leading center of speech and hearing research in the world, producing scientific and engineering knowledge of primary importance for the age of digital communication. This objective requires that the Institute conduct pioneering research on a continuing basis, attracting and educating the best and brightest minds in the field. It also requires that the knowledge and wisdom garnered at the Institute be widely disseminated, not only within the scientific and technical community, but to the general public as well. The Institute will establish a set of research programs focused on automatic speech recognition, hearing-aid technology and general research into the auditory and visual bases for spoken language processing. It will be necessary to attract top-flight scientific, technical and administrative staff, as well as secure the level of financial support required to sustain these activities. The scientific profile of the Institute should be sufficiently high at the end of this period that it is considered one of the world's major centers of speech and hearing research. This objective can only be accomplished through the publication of many dozens of important scientific papers, as well as through presentation of such material at key scientific conferences. The Institute will also host small-scale meetings and workshops on a regular basis in order to bring in a wide assortment of scientists who might not otherwise visit the facilities. By the end of the first five years the operating budget of the Institute should approach \$15 million per year and the endowment should exceed \$3 million.

Why establish the Institute at this point in time?

Speech is rapidly becoming the digital interface of choice as advances in microchip technology enable powerful computers to be embedded in small, hand-held devices. The awkward nature of keyboard input for such products creates a powerful motivation for developing alternative means of communication such as voice input. Recognition programs currently work well only for carefully spoken speech under pristine acoustic conditions, a far cry from the sort of conditions under which most human communication is conducted. The technology required to permit natural verbal interaction between human and machine requires extensive research into the nature of spoken language and the auditory mechanisms that shield linguistic information from the deleterious effects of acoustic interference. And such knowledge needs to be melded with creative, innovative engineering in order to build digital devices capable of seamless human interaction. Such an endeavor will likely require the expenditure of vast sums of money and engage the efforts of many thousands of individuals. The Institute can provide a cost-effective means of advancing this effort out of proportion to its size and budget.

How does the Institute's educational philosophy differ from that of other academic institutions?

Universities typically focus on imparting a certain body of intellectual knowledge to students, mainly through course work. Although this form of education is valuable at the beginning of a student's career its value diminishes as the student becomes increasingly familiar with the subject matter. At a certain point the student must begin to take responsibility for his or her own education, learning the technical skills required and most importantly, learning how to master new material quickly and in some depth. The thesis required for the master's and doctoral degrees are intended to provide this independent training, but this objective is rarely met in practice. Students seldom possess the breadth and depth of knowledge to define a problem on their own and to develop innovative techniques which clearly advance the field. The Institute will educate its students to transcend the current limitations of graduate education by fostering a climate of independence and responsibility. Students will be expected to read widely and deeply in both their specific field(s) of inquiry as well as in related scientific domains. Moreover, they will be expected to define a focus for their doctoral research by the end of their first year and to complete this research by the end of their third. The Institute will provide the technical resources to enable them to do so and encourage learning the requisite technical and intellectual skills from staff and fellow students. Students will be treated as colleagues in much the same way that medical students and residents are treated as such by their seniors. By encouraging students to assume responsibility for important, innovative projects it is anticipated that they will rise to the occasion and flourish under such conditions. But because there is much more to doing science than merely reading, programming and conducting experiments, students will also be trained to manage their time and energy, to make effective oral presentations and to write clearly and concisely for publication. These are skills that students rarely learn in graduate programs and the lack of which retards their intellectual growth and development, as well as their professional advancement.

How broad will the Institute's intellectual focus be?

No field of scientific endeavor possesses a monopoly on insight, technical prowess or innovation. Advances in one field may provide a breakthrough in some seeming unrelated area. It is for this reason that the focus of the Institute will be exceedingly broad, spanning the domains of physics, mathematics, computer science, statistics, engineering, psychology, linguistics, history, economics, social science and the humanities. Each of these intellectual domains potentially enriches the quality and depth of scientific research, even in fields as seemingly specialized as speech and hearing.

In what ways will the Institute prove to be of superior value compared with current academic centers devoted to speech and audio research?

The Institute is not intended to directly compete with university-based research centers. Rather, its goal is to develop a different type of research and educational model than is typically found in an academic environment. Training of students and post-docs will be of a more comprehensive and intense nature than most graduate programs provide, focusing on leadership, innovation, integrity, scholarship, planning and overall academic accomplishment. The aim of this program is to enable each individual to reach his or her full intellectual and creative potential, while fostering a spirit of cooperation and independence.

What advantages accrue from establishing the Institute as an independent organizational entity?

Universities typically require new research and educational initiatives to undergo an intensive review process that typically takes from two to five years to complete - an interval longer than desirable for an institute associated with such a dynamic, fast-moving field as speech. An independent status enables the Institute to establish a highly motivated and efficient administrative structure ideal for encouraging innovative approaches to research and education. Moreover, independent status enables the Institute to be far more aggressive with respect to funding initiatives than would otherwise be the case and provides an organizational infrastructure for rapid growth and innovation.

Why affiliate the Institute with an academic campus?

Proximity to a top-notch faculty of diverse background and to a heterogeneous student body, as well as access to a comprehensive library system, provides a rich intellectual and cultural milieu that enhances the activity of any scientific enterprise. It is important for the Institute to be within walking distance of the campus in order to encourage close interaction with faculty affiliates and students in general. A close campus connection also enhances the attractiveness of the Institute for visitors desiring to make connections with a broader spectrum of scientists and students than could be accommodated within the Institute proper.

How will it be possible to attract exceptional individuals to the Institute?

Many scientists and engineers prefer to work in an environment free of organizational pressures associated with corporate and academic environments in order to focus on research. Forty years ago, such companies as AT&T and IBM provided such a haven to those focused on technologically oriented research and attracted many of the world's most brilliant scientists and engineers to their fold. Such research havens rarely exist nowadays on account of the short-term research focus of most corporations. A financially well-endowed institute focused on cutting-edge, innovative research unfettered with administrative and pedagogical responsibilities should have no trouble attracting scientists and students of the highest caliber. A number of such individuals have already expressed a strong interest in joining the Institute upon its establishment (see the accompanying list of potential staff).

What incentives will be provided to encourage staff and students to remain productive and happy?

Most individuals are happiest when busy and productive - as long as credit is fairly given and financial remuneration generous. A rigorously structured research plan, in tandem with a keen sense of mission and of contributing to the common welfare is crucial. Frequent and intense discussions of scientific and technical nature, as well as a constant influx of visitors, is essential for sustaining an atmosphere of excitement and intellectual challenge. Salaries and benefits for staff should be comparable to what these individuals would receive working for first-tier corporate organizations in order that finances not dictate whether an individual chooses to remain or leave the Institute.

Why is it important to bring in a steady stream of international visitors?

No scientific environment, no matter how vibrant and dynamic, can sustain a climate of innovation and excitement without a steady influx of visitors from around the world. No single individual or group can keep up with the pace of scientific and technological development. Visitors can increase the Institute's awareness of interesting new developments in a manner difficult to achieve through other means. Often such fertilization pays off handsomely in terms of new ideas and approaches to important research problems. It is also advantageous for visitors to return to their home base with a sense of a keen interest in their research and a desire for future collaboration.

Why limit the term of student and post-doc residency to three years?

An oft-quoted corollary to Murphy's Law states that "the time required to complete a task expands to the amount allotted." A crisis demonstrates how much more can be done within a span of time than is normally carried out if the motivation is sufficiently high. Often, individuals engaged in such focused projects look back upon this time as among the happiest and most productive of their lives. A limited term of residency can thereby provide the sort of focus and intense concentration required to perform first-class research. Longer terms of residency can often lead to a less productive tenure due to a diminished sense of urgency in conducting the research.

How will the Institute obtain the financial support required to initiate its creation and sustain its development over a long time span?

The foundation of the Institute's long-term support will come from technology-focused companies that have a vested interest in maintaining a relation to a forward-looking research environment from which they may ultimately recruit staff scientists and engineers. These same companies may also choose to have some of their own research staff spend time at the Institute working on projects of mutual interest. About \$10-15 million per year will come from such sources. In addition, several million dollars will come from private foundations. Foreign and domestic governmental grants will provide an additional \$5 million in yearly funds. The intent is for the Institute to have a highly diversified source of funds in order to minimize the chances of any short- or long-term financial downturn.

How much will it cost for a company to serve as an Institute sponsor?

Sponsorship will be available in four grades. The entry-level grade, available only to corporations whose yearly revenues are less than \$50 million, is \$50,000. For larger companies the entry grade is \$100,000 and will entitle the company to have one of its staff spend up to three months per year at the Institute as well as early access to the Institute's technical reports. This level of sponsorship will also entitle the company to attend most of the Institute's special events. The next level of sponsorship is \$250,000 and entitles the company to have a seat on the Institute's advisory board. It also entitles the company to send three of its staff to the Institute for stays of up to 3 months each, as well as the opportunity for Institute students and post-docs to spend extended periods of time at their location. The highest level of sponsorship is \$500,000 and higher. It entitles the sponsor to have a seat on the Institute's board of directors, as well as full access to the Institute's staff, students and post-docs. Sponsorship at this level will also entitle the company to have up to five of its staff be present at the Institute at any one time (no limit on the duration of stay) and allow the company to have up to five students and post-docs work at their location for limited periods of time.

What specific benefits will corporations derive from sponsorship?

Institute sponsors will be treated as partners in the stewardship of the Institute. Each major sponsor will have a seat on the advisory board and will be given regular opportunities for providing feedback on the best ways for the Institute to serve its needs and those of the technical community at large. Engineering and scientific staff of sponsoring corporations will be able to work with Institute researchers and students on an extended basis, collaborating on projects of mutual interest. Sabbatical (and less-extended) visits will also be encouraged. Institute students and post-docs will also be able spend time at sponsor sites working on collaborative projects. Sponsors will be invited to special events at the Institute, including demonstrations of recent scientific and technical innovations. Institute technical reports will be provided in advance of their public release. It is anticipated that many of the employment opportunities offered to students and post-docs will come from sponsors.

Why should the Institute make the effort to secure government research grants to supplement the generous support from corporations and private foundations?

Securing public funds for research is becoming increasingly difficult. Yet the effort in obtaining such grants is often worthwhile as it motivates those involved in the grant writing process to hone their research strategy and focus to an extent that would otherwise be difficult to achieve. Peer-reviewed grant proposals also provide an excellent mechanism for testing hypotheses about the worthiness of research as well as funding a broader range of research than might otherwise be possible. Moreover, such governmental funds also provide a hedge against the time when private support may not be as abundant as desired. It is also desirable for students and post-docs to receive training in writing grant applications since it is likely that many of them will be required to regularly do so after leaving the Institute.

How much will scientists and technical/administrative staff be paid?

It is rare for scientists and engineers to be motivated primarily by financial considerations. It is generally the challenge of the research involved, as well as the attractiveness of the working environment that attracts talented individuals (and retains them). However, the value of talented individuals is widely appreciated and there are many companies and institutions willing to pay high salaries to attract such talent. For this reason, it is necessary for the Institute to pay generous salaries in order to insure that no potential candidate is discouraged from joining purely on financial grounds. Because the Institute will not be able to offer any form of equity (since it is a non-profit, tax-exempt institution) salaries will be slightly higher than those offered by for-profit organizations. In general this will mean that scientific staff will be paid between \$100,000 and \$200,000 per year and that post-docs will be paid \$75,000 per year. Good technical and administrative staff are both difficult to find and even harder to retain. For this reason it will be necessary to pay such staff personnel exceedingly generous salaries competitive with industry. Computer personnel will be paid between \$75,000 and \$150,000 per year. Administrative staff will be paid between \$40,000 and \$100,000 per year. All staff, students and post-docs will have full medical benefits. Permanent staff will be provided with a generous retirement package.

Further Information

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