

In the Senate of the United States,

October 16, 2002.

Resolved, That the bill from the House of Representatives (H.R. 3394) entitled “An Act to authorize funding for computer and network security research and development and research fellowship programs, and for other purposes.”, do pass with the following

AMENDMENT:

Strike out all after the enacting clause and insert:

1 ***SECTION 1. SHORT TITLE.***

2 *This Act may be cited as the “Cyber Security Research*

3 *and Development Act”.*

1 **SEC. 2. FINDINGS.**

2 *The Congress finds the following:*

3 (1) *Revolutionary advancements in computing*
4 *and communications technology have interconnected*
5 *government, commercial, scientific, and educational*
6 *infrastructures—including critical infrastructures for*
7 *electric power, natural gas and petroleum production*
8 *and distribution, telecommunications, transportation,*
9 *water supply, banking and finance, and emergency*
10 *and government services—in a vast, interdependent*
11 *physical and electronic network.*

12 (2) *Exponential increases in interconnectivity*
13 *have facilitated enhanced communications, economic*
14 *growth, and the delivery of services critical to the*
15 *public welfare, but have also increased the con-*
16 *sequences of temporary or prolonged failure.*

17 (3) *A Department of Defense Joint Task Force*
18 *concluded after a 1997 United States information*
19 *warfare exercise that the results “clearly demonstrated*
20 *our lack of preparation for a coordinated cyber and*
21 *physical attack on our critical military and civilian*
22 *infrastructure”.*

23 (4) *Computer security technology and systems*
24 *implementation lack—*

25 (A) *sufficient long term research funding;*

1 (B) adequate coordination across Federal
2 and State government agencies and among gov-
3 ernment, academia, and industry; and

4 (C) sufficient numbers of outstanding re-
5 searchers in the field.

6 (5) Accordingly, Federal investment in computer
7 and network security research and development must
8 be significantly increased to—

9 (A) improve vulnerability assessment and
10 technological and systems solutions;

11 (B) expand and improve the pool of infor-
12 mation security professionals, including re-
13 searchers, in the United States workforce; and

14 (C) better coordinate information sharing
15 and collaboration among industry, government,
16 and academic research projects.

17 (6) While African-Americans, Hispanics, and
18 Native Americans constitute 25 percent of the total
19 United States workforce and 30 percent of the college-
20 age population, members of these minorities comprise
21 less than 7 percent of the United States computer and
22 information science workforce.

23 **SEC. 3. DEFINITIONS.**

24 In this Act:

1 (1) *DIRECTOR*.—*The term “Director” means the*
 2 *Director of the National Science Foundation.*

3 (2) *INSTITUTION OF HIGHER EDUCATION*.—*The*
 4 *term “institution of higher education” has the mean-*
 5 *ing given that term in section 101(a) of the Higher*
 6 *Education Act of 1965 (20 U.S.C. 1001(a)).*

7 **SEC. 4. NATIONAL SCIENCE FOUNDATION RESEARCH.**

8 (a) *COMPUTER AND NETWORK SECURITY RESEARCH*
 9 *GRANTS*.—

10 (1) *IN GENERAL*.—*The Director shall award*
 11 *grants for basic research on innovative approaches to*
 12 *the structure of computer and network hardware and*
 13 *software that are aimed at enhancing computer secu-*
 14 *urity. Research areas may include—*

15 (A) *authentication, cryptography, and other*
 16 *secure data communications technology;*

17 (B) *computer forensics and intrusion detec-*
 18 *tion;*

19 (C) *reliability of computer and network ap-*
 20 *plications, middleware, operating systems, con-*
 21 *trol systems, and communications infrastructure;*

22 (D) *privacy and confidentiality;*

23 (E) *network security architecture, including*
 24 *tools for security administration and analysis;*

25 (F) *emerging threats;*

1 (G) *vulnerability assessments and tech-*
 2 *niques for quantifying risk;*

3 (H) *remote access and wireless security; and*

4 (I) *enhancement of law enforcement ability*
 5 *to detect, investigate, and prosecute cyber-crimes,*
 6 *including those that involve piracy of intellectual*
 7 *property.*

8 (2) *MERIT REVIEW; COMPETITION.—Grants shall*
 9 *be awarded under this section on a merit-reviewed*
 10 *competitive basis.*

11 (3) *AUTHORIZATION OF APPROPRIATIONS.—*
 12 *There are authorized to be appropriated to the Na-*
 13 *tional Science Foundation to carry out this*
 14 *subsection—*

15 (A) *\$35,000,000 for fiscal year 2003;*

16 (B) *\$40,000,000 for fiscal year 2004;*

17 (C) *\$46,000,000 for fiscal year 2005;*

18 (D) *\$52,000,000 for fiscal year 2006; and*

19 (E) *\$60,000,000 for fiscal year 2007.*

20 (b) *COMPUTER AND NETWORK SECURITY RESEARCH*
 21 *CENTERS.—*

22 (1) *IN GENERAL.—The Director shall award*
 23 *multiyear grants, subject to the availability of appro-*
 24 *priations, to institutions of higher education, non-*
 25 *profit research institutions, or consortia thereof to es-*

1 *tablish multidisciplinary Centers for Computer and*
 2 *Network Security Research. Institutions of higher*
 3 *education, nonprofit research institutions, or con-*
 4 *sortia thereof receiving such grants may partner with*
 5 *1 or more government laboratories or for-profit insti-*
 6 *tutions, or other institutions of higher education or*
 7 *nonprofit research institutions.*

8 (2) *MERIT REVIEW; COMPETITION.*—*Grants shall*
 9 *be awarded under this subsection on a merit-reviewed*
 10 *competitive basis.*

11 (3) *PURPOSE.*—*The purpose of the Centers shall*
 12 *be to generate innovative approaches to computer and*
 13 *network security by conducting cutting-edge, multi-*
 14 *disciplinary research in computer and network secu-*
 15 *rity, including the research areas described in sub-*
 16 *section (a)(1).*

17 (4) *APPLICATIONS.*—*An institution of higher*
 18 *education, nonprofit research institution, or consortia*
 19 *thereof seeking funding under this subsection shall*
 20 *submit an application to the Director at such time,*
 21 *in such manner, and containing such information as*
 22 *the Director may require. The application shall in-*
 23 *clude, at a minimum, a description of—*

1 (A) the research projects that will be under-
 2 taken by the Center and the contributions of each
 3 of the participating entities;

4 (B) how the Center will promote active col-
 5 laboration among scientists and engineers from
 6 different disciplines, such as computer scientists,
 7 engineers, mathematicians, and social science re-
 8 searchers;

9 (C) how the Center will contribute to in-
 10 creasing the number and quality of computer
 11 and network security researchers and other pro-
 12 fessionals, including individuals from groups
 13 historically underrepresented in these fields; and

14 (D) how the center will disseminate research
 15 results quickly and widely to improve cyber secu-
 16 rity in information technology networks, prod-
 17 ucts, and services.

18 (5) *CRITERIA.*—In evaluating the applications
 19 submitted under paragraph (4), the Director shall
 20 consider, at a minimum—

21 (A) the ability of the applicant to generate
 22 innovative approaches to computer and network
 23 security and effectively carry out the research
 24 program;

1 (B) the experience of the applicant in con-
 2 ducting research on computer and network secu-
 3 rity and the capacity of the applicant to foster
 4 new multidisciplinary collaborations;

5 (C) the capacity of the applicant to attract
 6 and provide adequate support for a diverse
 7 group of undergraduate and graduate students
 8 and postdoctoral fellows to pursue computer and
 9 network security research; and

10 (D) the extent to which the applicant will
 11 partner with government laboratories, for-profit
 12 entities, other institutions of higher education, or
 13 nonprofit research institutions, and the role the
 14 partners will play in the research undertaken by
 15 the Center.

16 (6) ANNUAL MEETING.—The Director shall con-
 17 vene an annual meeting of the Centers in order to fos-
 18 ter collaboration and communication between Center
 19 participants.

20 (7) AUTHORIZATION OF APPROPRIATIONS.—
 21 There are authorized to be appropriated for the Na-
 22 tional Science Foundation to carry out this
 23 subsection—

24 (A) \$12,000,000 for fiscal year 2003;

25 (B) \$24,000,000 for fiscal year 2004;

1 (C) \$36,000,000 for fiscal year 2005;

2 (D) \$36,000,000 for fiscal year 2006; and

3 (E) \$36,000,000 for fiscal year 2007.

4 **SEC. 5. NATIONAL SCIENCE FOUNDATION COMPUTER AND**
 5 **NETWORK SECURITY PROGRAMS.**

6 (a) *COMPUTER AND NETWORK SECURITY CAPACITY*
 7 *BUILDING GRANTS.*—

8 (1) *IN GENERAL.*—*The Director shall establish a*
 9 *program to award grants to institutions of higher*
 10 *education (or consortia thereof) to establish or im-*
 11 *prove undergraduate and master's degree programs in*
 12 *computer and network security, to increase the num-*
 13 *ber of students, including the number of students from*
 14 *groups historically underrepresented in these fields,*
 15 *who pursue undergraduate or master's degrees in*
 16 *fields related to computer and network security, and*
 17 *to provide students with experience in government or*
 18 *industry related to their computer and network secu-*
 19 *rity studies.*

20 (2) *MERIT REVIEW.*—*Grants shall be awarded*
 21 *under this subsection on a merit-reviewed competitive*
 22 *basis.*

23 (3) *USE OF FUNDS.*—*Grants awarded under this*
 24 *subsection shall be used for activities that enhance the*
 25 *ability of an institution of higher education (or con-*

1 *sortium thereof) to provide high-quality under-*
2 *graduate and master's degree programs in computer*
3 *and network security and to recruit and retain in-*
4 *creased numbers of students to such programs. Activi-*
5 *ties may include—*

6 *(A) revising curriculum to better prepare*
7 *undergraduate and master's degree students for*
8 *careers in computer and network security;*

9 *(B) establishing degree and certificate pro-*
10 *grams in computer and network security;*

11 *(C) creating opportunities for under-*
12 *graduate students to participate in computer*
13 *and network security research projects;*

14 *(D) acquiring equipment necessary for stu-*
15 *dent instruction in computer and network secu-*
16 *rity, including the installation of testbed net-*
17 *works for student use;*

18 *(E) providing opportunities for faculty to*
19 *work with local or Federal Government agencies,*
20 *private industry, nonprofit research institutions,*
21 *or other academic institutions to develop new ex-*
22 *pertise or to formulate new research directions in*
23 *computer and network security;*

24 *(F) establishing collaborations with other*
25 *academic institutions or academic departments*

1 that seek to establish, expand, or enhance pro-
2 grams in computer and network security;

3 (G) establishing student internships in com-
4 puter and network security at government agen-
5 cies or in private industry;

6 (H) establishing collaborations with other
7 academic institutions to establish or enhance a
8 web-based collection of computer and network se-
9 curity courseware and laboratory exercises for
10 sharing with other institutions of higher edu-
11 cation, including community colleges;

12 (I) establishing or enhancing bridge pro-
13 grams in computer and network security between
14 community colleges and universities; and

15 (J) any other activities the Director deter-
16 mines will accomplish the goals of this sub-
17 section.

18 (4) *SELECTION PROCESS.*—

19 (A) *APPLICATION.*—An institution of higher
20 education (or a consortium thereof) seeking fund-
21 ing under this subsection shall submit an appli-
22 cation to the Director at such time, in such man-
23 ner, and containing such information as the Di-
24 rector may require. The application shall in-
25 clude, at a minimum—

1 (i) a description of the applicant's
2 computer and network security research and
3 instructional capacity, and in the case of
4 an application from a consortium of insti-
5 tutions of higher education, a description of
6 the role that each member will play in im-
7 plementing the proposal;

8 (ii) a comprehensive plan by which the
9 institution or consortium will build instruc-
10 tional capacity in computer and informa-
11 tion security;

12 (iii) a description of relevant collabo-
13 rations with government agencies or private
14 industry that inform the instructional pro-
15 gram in computer and network security;

16 (iv) a survey of the applicant's historic
17 student enrollment and placement data in
18 fields related to computer and network secu-
19 rity and a study of potential enrollment
20 and placement for students enrolled in the
21 proposed computer and network security
22 program; and

23 (v) a plan to evaluate the success of the
24 proposed computer and network security
25 program, including post-graduation assess-

1 *ment of graduate school and job placement*
2 *and retention rates as well as the relevance*
3 *of the instructional program to graduate*
4 *study and to the workplace.*

5 *(B) AWARDS.—(i) The Director shall en-*
6 *sure, to the extent practicable, that grants are*
7 *awarded under this subsection in a wide range*
8 *of geographic areas and categories of institutions*
9 *of higher education, including minority serving*
10 *institutions.*

11 *(ii) The Director shall award grants under*
12 *this subsection for a period not to exceed 5 years.*

13 *(5) ASSESSMENT REQUIRED.—The Director shall*
14 *evaluate the program established under this subsection*
15 *no later than 6 years after the establishment of the*
16 *program. At a minimum, the Director shall evaluate*
17 *the extent to which the program achieved its objectives*
18 *of increasing the quality and quantity of students, in-*
19 *cluding students from groups historically underrep-*
20 *resented in computer and network security related*
21 *disciplines, pursuing undergraduate or master's de-*
22 *grees in computer and network security.*

23 *(6) AUTHORIZATION OF APPROPRIATIONS.—*
24 *There are authorized to be appropriated to the Na-*

1 *tional Science Foundation to carry out this*
 2 *subsection—*

3 (A) \$15,000,000 for fiscal year 2003;

4 (B) \$20,000,000 for fiscal year 2004;

5 (C) \$20,000,000 for fiscal year 2005;

6 (D) \$20,000,000 for fiscal year 2006; and

7 (E) \$20,000,000 for fiscal year 2007.

8 (b) *SCIENTIFIC AND ADVANCED TECHNOLOGY ACT OF*
 9 *1992.—*

10 (1) *GRANTS.—The Director shall provide grants*
 11 *under the Scientific and Advanced Technology Act of*
 12 *1992 (42 U.S.C. 1862i) for the purposes of section*
 13 *3(a) and (b) of that Act, except that the activities*
 14 *supported pursuant to this subsection shall be limited*
 15 *to improving education in fields related to computer*
 16 *and network security.*

17 (2) *AUTHORIZATION OF APPROPRIATIONS.—*
 18 *There are authorized to be appropriated to the Na-*
 19 *tional Science Foundation to carry out this*
 20 *subsection—*

21 (A) \$1,000,000 for fiscal year 2003;

22 (B) \$1,250,000 for fiscal year 2004;

23 (C) \$1,250,000 for fiscal year 2005;

24 (D) \$1,250,000 for fiscal year 2006; and

25 (E) \$1,250,000 for fiscal year 2007.

1 (c) *GRADUATE TRAINEESHIPS IN COMPUTER AND*
2 *NETWORK SECURITY RESEARCH.*—

3 (1) *IN GENERAL.*—*The Director shall establish a*
4 *program to award grants to institutions of higher*
5 *education to establish traineeship programs for grad-*
6 *uate students who pursue computer and network secu-*
7 *rity research leading to a doctorate degree by pro-*
8 *viding funding and other assistance, and by pro-*
9 *viding graduate students with research experience in*
10 *government or industry related to the students' com-*
11 *puter and network security studies.*

12 (2) *MERIT REVIEW.*—*Grants shall be provided*
13 *under this subsection on a merit-reviewed competitive*
14 *basis.*

15 (3) *USE OF FUNDS.*—*An institution of higher*
16 *education shall use grant funds for the purposes of—*

17 (A) *providing traineeships to students who*
18 *are citizens, nationals, or lawfully admitted per-*
19 *manent resident aliens of the United States and*
20 *are pursuing research in computer or network*
21 *security leading to a doctorate degree;*

22 (B) *paying tuition and fees for students re-*
23 *ceiving traineeships under subparagraph (A);*

24 (C) *establishing scientific internship pro-*
25 *grams for students receiving traineeships under*

subparagraph (A) in computer and network security at for-profit institutions, nonprofit research institutions, or government laboratories; and

(D) other costs associated with the administration of the program.

(4) *TRAINEESHIP AMOUNT.*—Traineeships provided under paragraph (3)(A) shall be in the amount of \$25,000 per year, or the level of the National Science Foundation Graduate Research Fellowships, whichever is greater, for up to 3 years.

(5) *SELECTION PROCESS.*—An institution of higher education seeking funding under this subsection shall submit an application to the Director at such time, in such manner, and containing such information as the Director may require. The application shall include, at a minimum, a description of—

(A) the instructional program and research opportunities in computer and network security available to graduate students at the applicant's institution; and

(B) the internship program to be established, including the opportunities that will be made available to students for internships at for-

1 *profit institutions, nonprofit research institu-*
2 *tions, and government laboratories.*

3 (6) *REVIEW OF APPLICATIONS.*—*In evaluating*
4 *the applications submitted under paragraph (5), the*
5 *Director shall consider—*

6 *(A) the ability of the applicant to effectively*
7 *carry out the proposed program;*

8 *(B) the quality of the applicant's existing*
9 *research and education programs;*

10 *(C) the likelihood that the program will re-*
11 *cruit increased numbers of students, including*
12 *students from groups historically underrep-*
13 *resented in computer and network security re-*
14 *lated disciplines, to pursue and earn doctorate*
15 *degrees in computer and network security;*

16 *(D) the nature and quality of the internship*
17 *program established through collaborations with*
18 *government laboratories, nonprofit research in-*
19 *stitutions, and for-profit institutions;*

20 *(E) the integration of internship opportuni-*
21 *ties into graduate students' research; and*

22 *(F) the relevance of the proposed program to*
23 *current and future computer and network secu-*
24 *rity needs.*

1 (7) *AUTHORIZATION OF APPROPRIATIONS.—*

2 *There are authorized to be appropriated to the Na-*
 3 *tional Science Foundation to carry out this*
 4 *subsection—*

5 (A) \$10,000,000 for fiscal year 2003;

6 (B) \$20,000,000 for fiscal year 2004;

7 (C) \$20,000,000 for fiscal year 2005;

8 (D) \$20,000,000 for fiscal year 2006; and

9 (E) \$20,000,000 for fiscal year 2007.

10 (d) *GRADUATE RESEARCH FELLOWSHIPS PROGRAM*

11 *SUPPORT.—Computer and network security shall be in-*
 12 *cluded among the fields of specialization supported by the*
 13 *National Science Foundation’s Graduate Research Fellow-*
 14 *ships program under section 10 of the National Science*
 15 *Foundation Act of 1950 (42 U.S.C. 1869).*

16 (e) *CYBER SECURITY FACULTY DEVELOPMENT*

17 *TRAINEESHIP PROGRAM.—*

18 (1) *IN GENERAL.—The Director shall establish a*
 19 *program to award grants to institutions of higher*
 20 *education to establish traineeship programs to enable*
 21 *graduate students to pursue academic careers in cyber*
 22 *security upon completion of doctoral degrees.*

23 (2) *MERIT REVIEW; COMPETITION.—Grants shall*
 24 *be awarded under this section on a merit-reviewed*
 25 *competitive basis.*

1 (3) *APPLICATION.*—*Each institution of higher*
 2 *education desiring to receive a grant under this sub-*
 3 *section shall submit an application to the Director at*
 4 *such time, in such manner, and containing such in-*
 5 *formation as the Director shall require.*

6 (4) *USE OF FUNDS.*—*Funds received by an insti-*
 7 *tution of higher education under this paragraph*
 8 *shall—*

9 (A) *be made available to individuals on a*
 10 *merit-reviewed competitive basis and in accord-*
 11 *ance with the requirements established in para-*
 12 *graph (7);*

13 (B) *be in an amount that is sufficient to*
 14 *cover annual tuition and fees for doctoral study*
 15 *at an institution of higher education for the du-*
 16 *ration of the graduate traineeship, and shall in-*
 17 *clude, in addition, an annual living stipend of*
 18 *\$25,000; and*

19 (C) *be provided to individuals for a dura-*
 20 *tion of no more than 5 years, the specific dura-*
 21 *tion of each graduate traineeship to be deter-*
 22 *mined by the institution of higher education, on*
 23 *a case-by-case basis.*

24 (5) *REPAYMENT.*—*Each graduate traineeship*
 25 *shall—*

1 (A) *subject to paragraph (5)(B), be subject*
 2 *to full repayment upon completion of the doc-*
 3 *toral degree according to a repayment schedule*
 4 *established and administered by the institution*
 5 *of higher education;*

6 (B) *be forgiven at the rate of 20 percent of*
 7 *the total amount of the graduate traineeship as-*
 8 *sistance received under this section for each aca-*
 9 *demic year that a recipient is employed as a*
 10 *full-time faculty member at an institution of*
 11 *higher education for a period not to exceed 5*
 12 *years; and*

13 (C) *be monitored by the institution of high-*
 14 *er education receiving a grant under this sub-*
 15 *section to ensure compliance with this subsection.*

16 (6) *EXCEPTIONS.—The Director may provide for*
 17 *the partial or total waiver or suspension of any serv-*
 18 *ice obligation or payment by an individual under*
 19 *this section whenever compliance by the individual is*
 20 *impossible or would involve extreme hardship to the*
 21 *individual, or if enforcement of such obligation with*
 22 *respect to the individual would be unconscionable.*

23 (7) *ELIGIBILITY.—To be eligible to receive a*
 24 *graduate traineeship under this section, an indi-*
 25 *vidual shall—*

1 (A) be a citizen, national, or lawfully ad-
 2 mitted permanent resident alien of the United
 3 States;

4 (B) demonstrate a commitment to a career
 5 in higher education.

6 (8) *CONSIDERATION.*—*In making selections for*
 7 *graduate traineeships under this paragraph, an insti-*
 8 *tution receiving a grant under this subsection shall*
 9 *consider, to the extent possible, a diverse pool of ap-*
 10 *plicants whose interests are of an interdisciplinary*
 11 *nature, encompassing the social scientific as well as*
 12 *the technical dimensions of cyber security.*

13 (9) *AUTHORIZATION OF APPROPRIATIONS.*—
 14 *There are authorized to be appropriated to the Na-*
 15 *tional Science Foundation to carry out this para-*
 16 *graph \$5,000,000 for each of fiscal years 2003*
 17 *through 2007.*

18 **SEC. 6. CONSULTATION.**

19 *In carrying out sections 4 and 5, the Director shall*
 20 *consult with other Federal agencies.*

21 **SEC. 7. FOSTERING RESEARCH AND EDUCATION IN COM-**
 22 **PUTER AND NETWORK SECURITY.**

23 *Section 3(a) of the National Science Foundation Act*
 24 *of 1950 (42 U.S.C. 1862(a)) is amended—*

1 (1) *by striking “and” at the end of paragraph*
 2 (6);

3 (2) *by striking “Congress.” in paragraph (7)*
 4 *and inserting “Congress ; and”; and*

5 (3) *by adding at the end the following:*

6 “(8) *to take a leading role in fostering and sup-*
 7 *porting research and education activities to improve*
 8 *the security of networked information systems.”.*

9 **SEC. 8. NATIONAL INSTITUTE OF STANDARDS AND TECH-**
 10 **NOLOGY PROGRAMS.**

11 (a) *RESEARCH PROGRAM.*—*The National Institute of*
 12 *Standards and Technology Act (15 U.S.C. 271 et seq.) is*
 13 *amended—*

14 (1) *by moving section 22 to the end of the Act*
 15 *and redesignating it as section 32;*

16 (2) *by inserting after section 21 the following*
 17 *new section:*

18 “*SEC. 22. RESEARCH PROGRAM ON SECURITY OF*
 19 *COMPUTER SYSTEMS*

20 “(a) *ESTABLISHMENT.*—*The Director shall establish a*
 21 *program of assistance to institutions of higher education*
 22 *that enter into partnerships with for-profit entities to sup-*
 23 *port research to improve the security of computer systems.*
 24 *The partnerships may also include government laboratories*
 25 *and nonprofit research institutions. The program shall—*

1 “(1) include multidisciplinary, long-term re-
2 search;

3 “(2) include research directed toward addressing
4 needs identified through the activities of the Computer
5 System Security and Privacy Advisory Board under
6 section 20(f); and

7 “(3) promote the development of a robust re-
8 search community working at the leading edge of
9 knowledge in subject areas relevant to the security of
10 computer systems by providing support for graduate
11 students, post-doctoral researchers, and senior re-
12 searchers.

13 “(b) *FELLOWSHIPS*.—

14 “(1) *POST-DOCTORAL RESEARCH FELLOW-*
15 *SHIPS*.—The Director is authorized to establish a pro-
16 gram to award post-doctoral research fellowships to
17 individuals who are citizens, nationals, or lawfully
18 admitted permanent resident aliens of the United
19 States and are seeking research positions at institu-
20 tions, including the Institute, engaged in research ac-
21 tivities related to the security of computer systems,
22 including the research areas described in section
23 4(a)(1) of the Cyber Security Research and Develop-
24 ment Act.

1 “(2) *SENIOR RESEARCH FELLOWSHIPS.*—*The Di-*
 2 *rector is authorized to establish a program to award*
 3 *senior research fellowships to individuals seeking re-*
 4 *search positions at institutions, including the Insti-*
 5 *tute, engaged in research activities related to the secu-*
 6 *rity of computer systems, including the research areas*
 7 *described in section 4(a)(1) of the Cyber Security Re-*
 8 *search and Development Act. Senior research fellow-*
 9 *ships shall be made available for established research-*
 10 *ers at institutions of higher education who seek to*
 11 *change research fields and pursue studies related to*
 12 *the security of computer systems.*

13 “(3) *ELIGIBILITY.*—

14 “(A) *IN GENERAL.*—*To be eligible for an*
 15 *award under this subsection, an individual shall*
 16 *submit an application to the Director at such*
 17 *time, in such manner, and containing such in-*
 18 *formation as the Director may require.*

19 “(B) *STIPENDS.*—*Under this subsection, the*
 20 *Director is authorized to provide stipends for*
 21 *post-doctoral research fellowships at the level of*
 22 *the Institute’s Post Doctoral Research Fellowship*
 23 *Program and senior research fellowships at levels*
 24 *consistent with support for a faculty member in*
 25 *a sabbatical position.*

1 “(c) *AWARDS; APPLICATIONS.*—

2 “(1) *IN GENERAL.*—*The Director is authorized to*
3 *award grants or cooperative agreements to institu-*
4 *tions of higher education to carry out the program es-*
5 *tablished under subsection (a). No funds made avail-*
6 *able under this section shall be made available di-*
7 *rectly to any for-profit partners.*

8 “(2) *ELIGIBILITY.*—*To be eligible for an award*
9 *under this section, an institution of higher education*
10 *shall submit an application to the Director at such*
11 *time, in such manner, and containing such informa-*
12 *tion as the Director may require. The application*
13 *shall include, at a minimum, a description of—*

14 “(A) *the number of graduate students an-*
15 *ticipated to participate in the research project*
16 *and the level of support to be provided to each;*

17 “(B) *the number of post-doctoral research*
18 *positions included under the research project and*
19 *the level of support to be provided to each;*

20 “(C) *the number of individuals, if any, in-*
21 *tending to change research fields and pursue*
22 *studies related to the security of computer sys-*
23 *tems to be included under the research project*
24 *and the level of support to be provided to each;*
25 *and*

1 “(D) *how the for-profit entities, nonprofit*
 2 *research institutions, and any other partners*
 3 *will participate in developing and carrying out*
 4 *the research and education agenda of the part-*
 5 *nership.*

6 “(d) *PROGRAM OPERATION.*—

7 “(1) *MANAGEMENT.*—*The program established*
 8 *under subsection (a) shall be managed by individuals*
 9 *who shall have both expertise in research related to*
 10 *the security of computer systems and knowledge of the*
 11 *vulnerabilities of existing computer systems. The Di-*
 12 *rector shall designate such individuals as program*
 13 *managers.*

14 “(2) *MANAGERS MAY BE EMPLOYEES.*—*Program*
 15 *managers designated under paragraph (1) may be*
 16 *new or existing employees of the Institute or individ-*
 17 *uals on assignment at the Institute under the Inter-*
 18 *governmental Personnel Act of 1970, except that indi-*
 19 *viduals on assignment at the Institute under the*
 20 *Intergovernmental Personnel Act of 1970 shall not di-*
 21 *rectly manage such employees.*

22 “(3) *MANAGER RESPONSIBILITY.*—*Program*
 23 *managers designated under paragraph (1) shall be re-*
 24 *sponsible for—*

1 “(A) establishing and publicizing the broad
2 research goals for the program;

3 “(B) soliciting applications for specific re-
4 search projects to address the goals developed
5 under subparagraph (A);

6 “(C) selecting research projects for support
7 under the program from among applications
8 submitted to the Institute, following consider-
9 ation of—

10 “(i) the novelty and scientific and
11 technical merit of the proposed projects;

12 “(ii) the demonstrated capabilities of
13 the individual or individuals submitting the
14 applications to successfully carry out the
15 proposed research;

16 “(iii) the impact the proposed projects
17 will have on increasing the number of com-
18 puter security researchers;

19 “(iv) the nature of the participation by
20 for-profit entities and the extent to which
21 the proposed projects address the concerns of
22 industry; and

23 “(v) other criteria determined by the
24 Director, based on information specified for

1 *inclusion in applications under subsection*
 2 *(c); and*

3 *“(D) monitoring the progress of research*
 4 *projects supported under the program.*

5 *“(4) REPORTS.—The Director shall report to the*
 6 *Senate Committee on Commerce, Science, and Trans-*
 7 *portation and the House of Representatives Com-*
 8 *mittee on Science annually on the use and responsi-*
 9 *bility of individuals on assignment at the Institute*
 10 *under the Intergovernmental Personnel Act of 1970*
 11 *who are performing duties under subsection (d).*

12 *“(e) REVIEW OF PROGRAM.—*

13 *“(1) PERIODIC REVIEW.—The Director shall pe-*
 14 *riodically review the portfolio of research awards*
 15 *monitored by each program manager designated in*
 16 *accordance with subsection (d). In conducting those*
 17 *reviews, the Director shall seek the advice of the Com-*
 18 *puter System Security and Privacy Advisory Board,*
 19 *established under section 21, on the appropriateness*
 20 *of the research goals and on the quality and utility*
 21 *of research projects managed by program managers in*
 22 *accordance with subsection (d).*

23 *“(2) COMPREHENSIVE 5-YEAR REVIEW.—The Di-*
 24 *rector shall also contract with the National Research*
 25 *Council for a comprehensive review of the program es-*

1 *tablished under subsection (a) during the 5th year of*
 2 *the program. Such review shall include an assessment*
 3 *of the scientific quality of the research conducted, the*
 4 *relevance of the research results obtained to the goals*
 5 *of the program established under subsection (d)(3)(A),*
 6 *and the progress of the program in promoting the de-*
 7 *velopment of a substantial academic research commu-*
 8 *nity working at the leading edge of knowledge in the*
 9 *field. The Director shall submit to Congress a report*
 10 *on the results of the review under this paragraph no*
 11 *later than 6 years after the initiation of the program.*

12 *“(f) DEFINITIONS.—In this section:*

13 *“(1) COMPUTER SYSTEM.—The term ‘computer*
 14 *system’ has the meaning given that term in section*
 15 *20(d)(1).*

16 *“(2) INSTITUTION OF HIGHER EDUCATION.—The*
 17 *term ‘institution of higher education’ has the meaning*
 18 *given that term in section 101(a) of the Higher Edu-*
 19 *cation Act of 1965 (20 U.S.C. 1001(a)).”.*

20 *(b) AMENDMENT OF COMPUTER SYSTEM DEFINI-*
 21 *TION.—Section 20(d)(1)(B)(i) of National Institute of*
 22 *Standards and Technology Act (15 U.S.C. 278g–*
 23 *3(d)(1)(B)(i)) is amended to read as follows:*

24 *“(i) computers and computer net-*
 25 *works;”.*

1 (c) *CHECKLISTS FOR GOVERNMENT SYSTEMS.*—

2 (1) *IN GENERAL.*—*The Director of the National*
 3 *Institute of Standards and Technology shall develop,*
 4 *and revise as necessary, a checklist setting forth set-*
 5 *tings and option selections that minimize the security*
 6 *risks associated with each computer hardware or soft-*
 7 *ware system that is, or is likely to become, widely*
 8 *used within the Federal government.*

9 (2) *PRIORITIES FOR DEVELOPMENT; EXCLUDED*
 10 *SYSTEMS.*—*The Director of the National Institute of*
 11 *Standards and Technology may establish priorities*
 12 *for the development of checklists under this paragraph*
 13 *on the basis of the security risks associated with the*
 14 *use of the system, the number of agencies that use a*
 15 *particular system, the usefulness of the checklist to*
 16 *Federal agencies that are users or potential users of*
 17 *the system, or such other factors as the Director deter-*
 18 *mines to be appropriate. The Director of the National*
 19 *Institute of Standards and Technology may exclude*
 20 *from the application of paragraph (1) any computer*
 21 *hardware or software system for which the Director of*
 22 *the National Institute of Standards and Technology*
 23 *determines that the development of a checklist is inap-*
 24 *propriate because of the infrequency of use of the sys-*
 25 *tem, the obsolescence of the system, or the inutility or*

1 *impracticability of developing a checklist for the sys-*
2 *tem.*

3 (3) *DISSEMINATION OF CHECKLISTS.*—*The Di-*
4 *rector of the National Institute of Standards and*
5 *Technology shall make any checklist developed under*
6 *this paragraph for any computer hardware or soft-*
7 *ware system available to each Federal agency that is*
8 *a user or potential user of the system.*

9 (4) *AGENCY USE REQUIREMENTS.*—*The develop-*
10 *ment of a checklist under paragraph (1) for a com-*
11 *puter hardware or software system does not—*

12 (A) *require any Federal agency to select the*
13 *specific settings or options recommended by the*
14 *checklist for the system;*

15 (B) *establish conditions or prerequisites for*
16 *Federal agency procurement or deployment of*
17 *any such system;*

18 (C) *represent an endorsement of any such*
19 *system by the Director of the National Institute*
20 *of Standards and Technology; nor*

21 (D) *preclude any Federal agency from pro-*
22 *curing or deploying other computer hardware or*
23 *software systems for which no such checklist has*
24 *been developed.*

1 (d) *FEDERAL AGENCY INFORMATION SECURITY PRO-*
 2 *GRAMS.*—

3 (1) *IN GENERAL.*—*In developing the agencywide*
 4 *information security program required by section*
 5 *3534(b) of title 44, United States Code, an agency*
 6 *that deploys a computer hardware or software system*
 7 *for which the Director of the National Institute of*
 8 *Standards and Technology has developed a checklist*
 9 *under subsection (c) of this section—*

10 (A) *shall include in that program an expla-*
 11 *nation of how the agency has considered such*
 12 *checklist in deploying that system; and*

13 (B) *may treat the explanation as if it were*
 14 *a portion of the agency's annual performance*
 15 *plan properly classified under criteria estab-*
 16 *lished by an Executive Order (within the mean-*
 17 *ing of section 1115(d) of title 31, United States*
 18 *Code).*

19 (2) *LIMITATION.*—*Paragraph (1) does not apply*
 20 *to any computer hardware or software system for*
 21 *which the National Institute of Standards and Tech-*
 22 *nology does not have responsibility under section*
 23 *20(a)(3) of the National Institute of Standards and*
 24 *Technology Act (15 U.S.C.278g-3(a)(3)).*

1 **SEC. 9. COMPUTER SECURITY REVIEW, PUBLIC MEETINGS,**
 2 **AND INFORMATION.**

3 *Section 20 of the National Institute of Standards and*
 4 *Technology Act (15 U.S.C. 278g–3) is amended by adding*
 5 *at the end the following new subsection:*

6 “(e) *AUTHORIZATION OF APPROPRIATIONS.—There are*
 7 *authorized to be appropriated to the Secretary \$1,060,000*
 8 *for fiscal year 2003 and \$1,090,000 for fiscal year 2004*
 9 *to enable the Computer System Security and Privacy Advi-*
 10 *sory Board, established by section 21, to identify emerging*
 11 *issues, including research needs, related to computer secu-*
 12 *rity, privacy, and cryptography and, as appropriate, to*
 13 *convene public meetings on those subjects, receive presen-*
 14 *tations, and publish reports, digests, and summaries for*
 15 *public distribution on those subjects.”.*

16 **SEC. 10. INTRAMURAL SECURITY RESEARCH.**

17 *Section 20 of the National Institute of Standards and*
 18 *Technology Act (15 U.S.C. 278g–3), as amended by this Act,*
 19 *is further amended by redesignating subsection (e) as sub-*
 20 *section (f), and by inserting after subsection (d) the fol-*
 21 *lowing:*

22 “(e) *INTRAMURAL SECURITY RESEARCH.—As part of*
 23 *the research activities conducted in accordance with sub-*
 24 *section (b)(4), the Institute shall—*

25 “(1) *conduct a research program to address*
 26 *emerging technologies associated with assembling a*

1 *networked computer system from components while*
 2 *ensuring it maintains desired security properties;*

3 *“(2) carry out research associated with improv-*
 4 *ing the security of real-time computing and commu-*
 5 *nications systems for use in process control; and*

6 *“(3) carry out multidisciplinary, long-term,*
 7 *high-risk research on ways to improve the security of*
 8 *computer systems.”.*

9 **SEC. 11. AUTHORIZATION OF APPROPRIATIONS.**

10 *There are authorized to be appropriated to the Sec-*
 11 *retary of Commerce for the National Institute of Standards*
 12 *and Technology—*

13 *(1) for activities under section 22 of the National*
 14 *Institute of Standards and Technology Act, as added*
 15 *by section 8 of this Act—*

16 *(A) \$25,000,000 for fiscal year 2003;*

17 *(B) \$40,000,000 for fiscal year 2004;*

18 *(C) \$55,000,000 for fiscal year 2005;*

19 *(D) \$70,000,000 for fiscal year 2006;*

20 *(E) \$85,000,000 for fiscal year 2007; and*

21 *(2) for activities under section 20(f) of the Na-*
 22 *tional Institute of Standards and Technology Act, as*
 23 *added by section 10 of this Act—*

24 *(A) \$6,000,000 for fiscal year 2003;*

25 *(B) \$6,200,000 for fiscal year 2004;*

1 (C) \$6,400,000 for fiscal year 2005;

2 (D) \$6,600,000 for fiscal year 2006; and

3 (E) \$6,800,000 for fiscal year 2007.

4 **SEC. 12. NATIONAL ACADEMY OF SCIENCES STUDY ON COM-**
 5 **PUTER AND NETWORK SECURITY IN CRITICAL**
 6 **INFRASTRUCTURES.**

7 (a) *STUDY.*—Not later than 3 months after the date
 8 of the enactment of this Act, the Director of the National
 9 Institute of Standards and Technology shall enter into an
 10 arrangement with the National Research Council of the Na-
 11 tional Academy of Sciences to conduct a study of the
 12 vulnerabilities of the Nation’s network infrastructure and
 13 make recommendations for appropriate improvements. The
 14 National Research Council shall—

15 (1) review existing studies and associated data
 16 on the architectural, hardware, and software
 17 vulnerabilities and interdependencies in United
 18 States critical infrastructure networks;

19 (2) identify and assess gaps in technical capa-
 20 bility for robust critical infrastructure network secu-
 21 rity and make recommendations for research prior-
 22 ities and resource requirements; and

23 (3) review any and all other essential elements
 24 of computer and network security, including security

1 of industrial process controls, to be determined in the
2 conduct of the study.

3 (b) *REPORT.*—*The Director of the National Institute*
4 *of Standards and Technology shall transmit a report con-*
5 *taining the results of the study and recommendations re-*
6 *quired by subsection (a) to the Senate Committee on Com-*
7 *merce, Science, and Transportation and the House of Rep-*
8 *resentatives Committee on Science not later than 21 months*
9 *after the date of enactment of this Act.*

10 (c) *SECURITY.*—*The Director of the National Institute*
11 *of Standards and Technology shall ensure that no informa-*
12 *tion that is classified is included in any publicly released*
13 *version of the report required by this section.*

14 (d) *AUTHORIZATION OF APPROPRIATIONS.*—*There are*
15 *authorized to be appropriated to the Secretary of Commerce*
16 *for the National Institute of Standards and Technology for*
17 *the purposes of carrying out this section, \$700,000.*

18 **SEC. 13. COORDINATION OF FEDERAL CYBER SECURITY RE-**

19 **SEARCH AND DEVELOPMENT**

20 *The Director of the National Science Foundation and*
21 *the Director of the National Institute of Standards and*
22 *Technology shall coordinate the research programs author-*
23 *ized by this Act or pursuant to amendments made by this*
24 *Act. The Director of the Office of Science and Technology*
25 *Policy shall work with the Director of the National Science*

1 *Foundation and the Director of the National Institute of*
 2 *Standards and Technology to ensure that programs author-*
 3 *ized by this Act or pursuant to amendments made by this*
 4 *Act are taken into account in any government-wide cyber*
 5 *security research effort.*

6 **SEC. 14. OFFICE OF SPACE COMMERCIALIZATION.**

7 *Section 8(a) of the Technology Administration Act of*
 8 *1998 (15 U.S.C. 1511e(a)) is amended by inserting “the*
 9 *Technology Administration of” after “within”.*

10 **SEC. 15. TECHNICAL CORRECTION OF NATIONAL CON-**
 11 **STRUCTION SAFETY TEAM ACT.**

12 *Section 2(c)(1)(d) of the National Construction Safety*
 13 *Team Act is amended by striking “section 8;” and inserting*
 14 *“section 7;”.*

15 **SEC. 16. GRANT ELIGIBILITY REQUIREMENTS AND COMPLI-**
 16 **ANCE WITH IMMIGRATION LAWS.**

17 *(a) IMMIGRATION STATUS.—No grant or fellowship*
 18 *may be awarded under this Act, directly or indirectly, to*
 19 *any individual who is in violation of the terms of his or*
 20 *her status as a nonimmigrant under section 101(a)(15)(F),*
 21 *(M), or (J) of the Immigration and Nationality Act (8*
 22 *U.S.C. 1101(a)(15)(F), (M), or (J)).*

23 *(b) ALIENS FROM CERTAIN COUNTRIES.—No grant or*
 24 *fellowship may be awarded under this Act, directly or indi-*
 25 *rectly, to any alien from a country that is a state sponsor*

1 *of international terrorism, as defined under section 306(b)*
 2 *of the Enhanced Border Security and VISA Entry Reform*
 3 *Act (8 U.S.C. 1735(b)), unless the Secretary of State deter-*
 4 *mines, in consultation with the Attorney General and the*
 5 *heads of other appropriate agencies, that such alien does*
 6 *not pose a threat to the safety or national security of the*
 7 *United States.*

8 (c) *NON-COMPLYING INSTITUTIONS.—No grant or fel-*
 9 *lowship may be awarded under this Act, directly or indi-*
 10 *rectly, to any institution of higher education or non-profit*
 11 *institution (or consortia thereof) that has—*

12 (1) *materially failed to comply with the record-*
 13 *keeping and reporting requirements to receive non-*
 14 *immigrant students or exchange visitor program par-*
 15 *ticipants under section 101(a)(15)(F), (M), or (J) of*
 16 *the Immigration and Nationality Act (8 U.S.C.*
 17 *1101(a)(15)(F), (M), or (J)), or section 641 of the Il-*
 18 *legal Immigration Reform and Responsibility Act of*
 19 *1996 (8 U.S.C. 1372), as required by section 502 of*
 20 *the Enhanced Border Security and VISA Entry Re-*
 21 *form Act (8 U.S.C. 1762); or*

22 (2) *been suspended or terminated pursuant to*
 23 *section 502(c) of the Enhanced Border Security and*
 24 *VISA Entry Reform Act (8 U.S.C 1762(c)).*

1 **SEC. 17. REPORT ON GRANT AND FELLOWSHIP PROGRAMS.**

2 *Within 24 months after the date of enactment of this*
3 *Act, the Director, in consultation with the Assistant to the*
4 *President for National Security Affairs, shall submit to*
5 *Congress a report reviewing this Act to ensure that the pro-*
6 *grams and fellowships are being awarded under this Act*
7 *to individuals and institutions of higher education who are*
8 *in compliance with the Immigration and Nationality Act*
9 *(8 U.S.C. 1101 et seq.) in order to protect our national secu-*
10 *rity.*

Attest:

Secretary.

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AMENDMENT