The Science and Technology Council of the Academy of Motion Picture Arts and Sciences is composed of Academy members who have distinguished themselves in various areas of technology, as well as supporting Academy staff. The members' expertise encompasses the fields of cinematography (production and technical), digital imaging, exhibition techniques, animation, electronics and related research, film and laboratory processing, lighting, projection, production, sound, as well as the engineering and exploration of mechanical and optical effects.

The Science and Technology Council Internship Program offers an extraordinary opportunity for full-time continuing students to experience a real-world production environment, or to participate in advanced technology development efforts. The Internship program is geared towards engaging students who are planning to pursue a career utilizing or developing cutting-edge technologies for motion picture production. In particular, prospective interns should be interested in the development of CG technology for motion pictures, imaging science for motion pictures, robotics, archiving, or the technical aspects of the creation of digital characters or visual effects.

• Students considered for this program must be recommended by their faculty and be returning to school upon completion of their internship. Students may apply by contacting their school representative (please see the attached list).

• Our 2010 hosts include Pixar Animation Studios, Rhythm & Hues, Industrial Light & Magic (ILM), and Technicolor. These companies specialize in areas of technology such as programming, animation, visual effects and production management; and will each host one intern.

• In addition, the Science and Technology Council is offering two technology-focused internships this year.

• Selected candidates must meet all submission requirements, and upon acceptance into the program, each intern is expected to complete an eight-week to twelve-week full-time internship at one of the companies. Intern assignments may include (but are not limited to) active research projects, administrative tasks, and production duties. Interns may also take advantage of unique opportunities to participate in industry and academic events.

• The Science and Technology Council Internship Program provides a stipend of $4,000 to each intern. Interns are responsible for all housing, transportation and living expenses.

• Submissions must be postmarked no later than March 1, 2010, and selection is at the sole discretion of the Science and Technology Council Internship Program Selection Committee.

• Candidates will be notified of acceptance into the program on or before April 9, 2010.

Application postmark deadline is March 1, 2010
THE ACADEMY
OF MOTION PICTURE ARTS AND SCIENCES

SCIENCE AND TECHNOLOGY COUNCIL INTERNSHIP PROGRAM 2010
PARTICIPATING HOST STUDIOS & COMPANIES

SAN FRANCISCO / BAY AREA HOSTS

• Industrial Light & Magic (San Francisco, CA)
Since 1975, Industrial Light & Magic (ILM) has been providing post-production visual effects services to the entertainment industry. Motion pictures, commercials, trailers, music videos and special venue projects have utilized ILM’s unequaled artistry in techniques such as model making, matte painting, computer-generated imagery, digital animation and a variety of related processes required in the production of visual effects. Groundbreaking software required for digital image production has been developed and shared with the industry at large and adopted by other companies and software manufacturers. ILM regularly consults with some of the industry's most highly regarded filmmakers on proof of concept tests. ILM has been associated with fourteen movies which have earned the Oscar for Best Visual Effects and has been awarded seventeen technical achievement awards from the Academy of Motion Picture Arts and Sciences.

• Pixar Animation Studios (Emeryville, CA)
Pixar Animation Studios is an award-winning computer animation studio with the technical, creative and production capabilities to create a new generation of animated feature films, merchandise and other related products. Pixar’s objective is to combine proprietary technology and world-class creative talent to develop computer-animated feature films with memorable characters and heartwarming stories that appeal to audiences of all ages. In partnership with Walt Disney Pictures, Pixar created and produced TOY STORY (1995), A BUG’S LIFE (1998), TOY STORY 2 (1999), MONSTERS, INC. (2001), FINDING NEMO (2003), THE INCREDIBLES (2004), CARS (2006) and WALL·E (2008), which won the Oscar® for Best Animated Feature Film.

LOS ANGELES / SOUTHERN CALIFORNIA HOSTS

• Rhythm & Hues (Los Angeles, CA)
One of the world's leading producers of quality character animation and visual effects for the entertainment industry, Rhythm & Hues’ award-winning film division is a state-of-the-art production facility with more than 100 feature films to its credit, including BABE, which earned the Oscar® in 1995 for Visual Effects, and THE CHRONICLES OF NARNIA: THE LION, THE WITCH AND THE WARDROBE (nominated in the same category in 2005). The employees of the studio are also the recipient of two Scientific and Technical Awards, one for the development of a proprietary film scanner, and the other for its role in the development of the Wavefront Advanced Visualizer, which paved the way for modern computer graphics software applications.

• Technicolor (Los Angeles, CA)
For more than 90 years, Technicolor has been pioneering technology-based creation solutions for the media and entertainment industries, from the biggest studios and networks to independent filmmakers and startup media companies. Technicolor is a leading provider of production, post-production, manufacturing, distribution and network management services. The company is a principal developer and supplier of services for end-to-end digital cinema distribution, channel origination and broadcast playout, out-of-home advertising and electronic content delivery services. Technicolor is one of the world's largest film processors, with the ability to process more than five billion feet of motion picture film annually, and the world's largest manufacturer and distributor of DVDs and CDs, with the capacity to produce more than 1.8 billion DVDs and 170 million CDs annually. Today, we're bringing leading-edge digital technologies and solutions to the creative community on a worldwide basis while continuing to innovate new technologies for film.
• The Science and Technology Council of the Academy of Motion Picture Arts and Sciences (Hollywood, CA)

The Academy of Motion Picture Arts and Sciences is the world’s preeminent movie-related organization, with a membership of more than 6,000 of the most accomplished men and women working in cinema. In addition to the annual Academy Awards® – in which the members vote to select the nominees and winners – the Academy presents a diverse year-round slate of public programs, exhibitions and events; provides financial support to a wide range of other movie-related organizations and endeavors; acts as a neutral advocate in the advancement of motion picture technology; and, through its Margaret Herrick Library and Academy Film Archive, collects, preserves, restores and provides access to movies and items related to their history. Through these and other activities the Academy serves students, historians, the entertainment industry and people everywhere who love movies.

Established in 2003, the Science and Technology Council is charged with executing the Academy’s mission to advance the motion picture sciences, and it does this through a wide-ranging slate of educational programs, technology history efforts, collaborative advanced technology programs, and scientific research.
Eligibility Guidelines

How to Apply:
To be eligible, students must be enrolled in a participating school for the upcoming term and be returning to school following the internship. Students must be eligible to work in the United States and provide their own housing, transportation and living expenses. Selection is at the sole discretion of the Science and Technology Council Internship Selection Committee. Along with a completed application form, please include the following:

- Brief cover letter detailing internship intentions, your and career objectives
- Resume
- Proof of school registration
- Proof of overall GPA of at least 3.0
- Proof of academic enrollment for the Fall 2010 term
- Proof of eligibility to work in the United States
- Proof of major in computer animation, digital arts, computer science, library science, engineering, production management, or related field
- Letter of recommendation from school chair and faculty member
- Specific statement from the candidate on why he or she has selected a particular internship position to apply for. Statement should include a description of relevant course work and/or the nature of his or her current academic area of research, or thesis work and how it indicates their preparedness for their internship(s) of choice.
- Examples of work (portfolio, code samples, and/or demo reel demonstrating relevant abilities).
  Reels and portfolios will not be returned.
- Letter of recommendation from industry professional (optional)

Eligibility:

- Must be a U.S. citizen, permanent resident or registered alien with the right to work in the United States.
- Must currently be enrolled in a participating accredited program and carry a minimum of 12 credits.
- Must return to the participating school immediately upon completion of the internship.
- Must maintain a minimum GPA of 3.0 and must receive passing grades in all classes.
- Must be eligible for academic credit.
- Submission must be the sole work of the applicant.
- **NO TELEPHONE CALLS PLEASE.** Questions should first be directed to your academic representative.

**IMPORTANT DATES:**

Submission: Postmarked no later than March 1, 2010

Notification: April 9, 2010

Full-time Eight-Twelve Week Internship: June to August 2010

Send Application To:

Science and Technology Council Internship Program
Academy of Motion Picture Arts and Sciences
1313 North Vine Street, 3rd Floor
Hollywood, California 90028
2010 INTERNSHIP DESCRIPTIONS

On your application please indicate which position or positions you are applying for by order of preference. You may list up to five. In your letter accompanying your application you MUST indicate why you are interested in a certain position(s) and what qualifies you for it. Specific examples referring to your coursework, thesis or research will be very helpful in determining eligibility and placement. Please review the internship descriptions carefully.

RESEARCH GROUP INTERNSHIPS
These positions in the Research Group are within our host studios and are intended to assist in the creation, implementation and transfer of new technology related to computer graphics-based filmmaking. These positions require a deep understanding of mathematical algorithms, an ability to collaborate in small to medium sized groups consisting of world-class computer graphics researchers, and skill in rapidly implementing and testing new algorithms.

1. LARGE FORMAT MULTI-TOUCH DISPLAYS FOR MOVIE MAKING

Large format multi-touch displays such as the Microsoft Surface have the potential to dramatically improve movie making interfaces. Most previous and current research is focused on the use of multi-touch devices for 2D applications. The goal of this project is to develop novel multi-touch interfaces for use in the production of 3D computer graphics films.

2. RESEARCH AND DEVELOPMENT INTERNSHIP

In this position, the intern will be expected to work alongside full-time engineers and make solid contributions to their development efforts. The host company has a large body of proprietary software that works alongside commercial tools like Maya, Nuke, and Photoshop. The principal system, Zeno, includes tools for modeling, animation, motion tracking, physical simulation, lighting, and more. Development efforts will include supporting the basic application framework as well as developing special-purpose discipline-specific tools; some development of plug-ins for commercial systems may be required. Ideally, potential interns will show evidence of a significant software project, either in a graduate school lab, or at a previous internship or past employment. The single greatest factor in the success of an intern is his or her ability to work well with others, since contributions to the work of others is critical. Teamwork and collaboration is of utmost importance to this position as no employee or intern ever works in isolation.

Areas of research that are of particular immediate interest to this position include:
- Physical simulation - numerical methods, and physical-based modeling GPGPU programming
- Computer vision - motion tracking, facial tracking, photo-modeling, and geometric reconstruction
- Lighting/rendering/shading - lighting models, BRDF acquisition, and image-based lighting

SPECIFIC REQUIREMENTS:
- Experience with C++ and Python
- Knowledge of version control system, especially perforce or subversion
- Experience with Linux and/or OSX is essential
- Prior Internship experience working with a production or commercial software company
- Proven track record of practical software engineering
GENERAL QUALIFICATIONS FOR THE RESEARCH GROUP INTERNSHIP:
- Excellence in problem solving
- Strong math and computer graphics experience
- Strong communication skills
- Strong software engineering skills with expertise in C and C++
- 1+ years of research experience
- Ability to work well with a wide range of personality types

STUDIO TOOLS INTERNSHIPS
These positions are in the Studio Tools Department within one of our host studios, and are responsible for developing in-house proprietary animation software. The host studio's engineering team is looking for software engineers to help create and maintain new software for the studio. The position requires a deep understanding of software application engineering, an ability to collaborate in a large cross-functional team of world-class developers, and skill in designing and implementing robust, easy to maintain code.

3. NEW LOOKS
The frontier of possible visual styles that can be achieved in the medium of computer graphics is limited only by our imaginations. The goal of this project is to explore radically different styles for visual story telling. The project team consists of a few technologists and artists working closely together to discover new artistic styles and the corresponding software tools for eventual use in future films.

4. NEXT-GENERATION ANIMATION SYSTEM - DEVELOPMENT AND EVALUATION OF EXTENSION MECHANISM
This internship will assist a major studio project in developing a new generation of animation tools. Part of the project includes an extension mechanism that is implemented in Python. The “Studio Tools” intern will have the opportunity to develop extensions for the system, programming in Python and evaluating the results. The intern might develop interactive tools for scene composition, camera placement and animation, character animation, or lighting, for example.

GENERAL QUALIFICATIONS FOR THE STUDIO TOOLS INTERNSHIPS:
- Strong computer science skills
- Interest in interactive web-based system development
- Ability to creatively problem-solve, conceive, test and evaluate ideas
- Experience with cinematography, storyboarding, and/or photographic composition
- Knowledge in various operating systems, databases and computer languages
- Ability to work well with a wide range of personality types and clearly communicate ideas

STUDIO-BASED TECHNOLOGY INTERNSHIPS
These positions are in the Studio-Based Technology Department within one of our host studios, and cover a wide range of skills including program development, engineering, physics and robotics. The host studio's engineering team is looking for interns fluent in C++, Python, OpenGL, QT and Linux; each position requires a different set of required skills (please see internships 5 through 11). The “Research” intern would assist in the development, prototyping and testing of new computer graphics algorithms as well as direct participation in the transfer of new technology to the rest of the host studio.
5. **Animation Programming Internship**
   This internship will focus on analyzing character motion created by professional animators through the estimation of a physical model of a character. The intern will be responsible for detecting and visualizing instances where the physical properties of the character motion violate the traditional laws of physics. The goal is to better inform animators of physically valid motion with the intent of creating more realistic animation, as well as to produce automatic methods of correcting hand-created character motion.

**Specific Requirements:**
- Knowledge of physics
- Knowledge of numerical methods
- Knowledge of C++

6. **Imaging Systems and Color Spaces**
   The intern will be exposed to the host studio’s full production, post-production and content distribution pipeline. Facets of the pipeline include: on-location services; digital dailies on demand; digital intermediate and film-out services; theatrical release and digital cinema services; and feature mastering. The intern will be required to contribute a high level of system design understanding in the interaction of CPU, GPU, software drivers and operating systems. In addition, the intern will be responsible for characterizing imaging systems using a working knowledge of color spaces, color representation in memory and color image file formats. He/she will be responsible for working closely with the color scientists and usability teams to identify and define key product performance metrics.

**Specific Requirements:**
- Excellent written/verbal communication, problem solving and analytical skills
- Experience developing software applications with C++/C in a Unix/Linux/Mac or Windows environment
- Must be a full-time student attending an accredited college/university or film/trade school in the Computer Science or Physics fields
- GPU software development knowledge and experience
- Solid understanding of Image Processing and how it applies to the Post Production environment.

7. **Interactive Lighting Application Programming Internship**
   The intern will primarily work as a GPU Programmer to help develop portions of the GPU component.

**Specific Requirements:**
- Knowledge of OpenGL
- Knowledge of OpenCL
- Knowledge of C++
8. **Interactive Lighting Application Programming Internship**
The intern will primarily work as a GUI Programmer to help develop portions of the GUI component.

**Specific Requirements:**
- Knowledge of OpenGL
- Knowledge of QT
- Knowledge of C++
- Knowledge of Python

9. **Interactive Lighting Application Programming Internship**
The intern will primarily work as a Node Programmer to help develop nodes within the application.

**Specific Requirements:**
- Knowledge of Python and/or C++
- Familiarity with compositing and lighting algorithms
- Knowledge of formal testing procedures is required

10. **Interactive Lighting Application Programming Internship**
The intern will primarily work as a Test Suite Engineer with internal developers to develop a test suite.

**Specific Requirements:**
- Knowledge of formal software testing procedures is required

11. **Interactive Lighting Application Programming Internship**
The intern will primarily use OpenGL Geometry Optimization to work with internal developers to optimize our OpenGL geometry submission code.

**Specific Requirements:**
- Knowledge of OpenGL

**General Qualifications for the Studio-Based Technology Internships:**
- Strong software engineering skills
- Ability to collaborate with other designers
- Knowledge of formal testing procedures
- Strong math skills - specifically geometry and linear algebra
- Knowledge of mechanical engineering and an interest in robotics

**Council Technology Projects**
The Council Technology Projects are offered by the Science and Technology Council of the Academy of Motion Picture Arts and Sciences. Interns selected to work on these projects will support the Council’s research, digital motion picture preservation and image interchange efforts. Applicants must have excellent oral, written, and organizational skills, be detail oriented, and have a basic knowledge of motion picture technology. See positions below for specific requirements.
12. **Digital Archival Intern**
The Academy has partnered with the Library of Congress through the NDIIPP Program (http://www.digitalpreservation.gov) to study current issues in the preservation of digital motion picture materials. The Digital Motion Picture Archive Framework Project is building upon current Academy research on digital preservation issues from the perspective of the major motion picture studios, extending the effort to include independent filmmakers and smaller film archives. The Digital Archival intern position will be a direct source of support to the Digital Motion Picture Archive Framework Project. The intern will gain experience with innovative digital preservation technologies, have the opportunity to learn about current trends in digital archives, learn about the Library of Congress NDIIPP initiative as well as participate in the planning and implementation of a digital preservation system. The responsibilities of this position include assistance in the content audit of digital motion picture materials, cataloging and classification of digital motion picture materials, assistance in the migration of digital motion picture data to various storage media and other related duties as assigned.

**Specific Requirements:**
- A familiarity with Library of Congress Classification Schedules, Library of Congress Subject Headings, AACR2 (Anglo American Cataloguing Rules) and metadata standards
- Proficiency with Mac and PC-based productivity software including integrated library software
- Enrolled in an accredited Master of Library and Information Science university degree program or graduate level Motion Picture Archival/Preservation Program

13. **Imaging Science Intern**
The Academy’s Science and Technology Council is developing an architecture of, and supporting tools for digital motion picture mastering applications. The Image Interchange Framework addresses the lack of industry standards for the interchange of today’s digitally mastered motion picture elements. It is a set of components that facilitates a wide range of motion picture workflows while eliminating the ambiguity inherent in today’s file formats. The Imaging Science intern position will support the Image Interchange Framework Project, and will be in direct contact with innovative image processing technologies. The Imaging Science intern will have the opportunity to learn about current trends in motion picture production, post-production, and associated technologies. The Imaging Science intern will also participate in the software development of the Image Interchange Framework software developers kit and reference implementation.

**Specific Requirements:**
- Knowledge of data structures, algorithm development, and programming methodologies
- Experience applying the principals of linear and nonlinear systems
- Experience applying inferential statistics, regression analysis, and matrix algebra
- Experience with GPU programming using Nvidia Cg
- Ability to demonstrate successful collaborative software development project experience including code samples if requested
- Experience using SVN and CVS
- Experience with image file formats including OpenEXR, DPX, & TIFF
- Experience with Mathworks Matlab helpful
- Experience with open source software repositories including SourceForge and Savannah
• Proficiency with writing platform independent software using the C++ and C programming languages and the FLTK toolkit
• Enrolled in an accredited Bachelor or Master university degree program in Engineering, Computer Science, Information Systems, Information Technology, or a film-related major with a technical background. No graduating candidates will be accepted. Interns should have at least one semester left before they earn their degree.

**General Qualifications for the In-House Technology Internships:**

- Strong communication and organizational skills
- Ability to work independently as well as part of a team
- Work may involve lifting boxes weighing up to 50 lbs and accessing boxes from tall shelving
- Knowledge of motion picture technology helpful
- Experience with image processing and color science terms and concepts a plus
Science and Technology Council Internship Program 2010
Agreement of expectations

Please read, sign, and include in your application.

What a Science and Technology Council intern can expect:

- Real-world, firsthand experience to aspects of the production, post production pipeline and processes, and/or digital archiving processes. Experience may be in the fields of digital animation, live action visual effects, CG features, performance capture, commercials, shorts, sound, automation, interface design, software and/or pipeline development.

- An attempt to match the interests of the intern with the activities of the host organization, and to structure every internship individually.

- Personal responsibility for housing, transportation and living expenses.

- Welcomed access to the host facility.

- A computer workstation or workspace, access to production tools and software, an email account, and a telephone within their appointed host organization.

- Interactions with industry professionals at all levels and from diverse disciplines within the host organization.

- Assignment to a feature production or department as a production assistant at a host organization.

- A unique opportunity to gather information to take back to school immediately upon completion of the internship.

- Professional in-house training (as required) in third party and proprietary production software, tools, and methods used in production.

- An opportunity to meet with representatives of the Science and Technology Council and/or program chair, review and give feedback of program (via phone conference or onsite).

I have read and agree to all of the expectations listed above.

__________________________  ____________________________  ________________
Signature (Student)          Please print name and school                                                  Date
What the Science and Technology Council can expect from an intern:

- A full-time onsite commitment of eight-weeks to twelve-weeks at a participating host organization.

- Sensitivity to the time constraints of employees. All meetings with artists and production staff from other participating hosts should be scheduled through the office of the Science and Technology Council Internship Program Chair.

- Understanding that participating host organizations are fully engaged in feature production, and offer general service to outside facilities, including the active research arm of the Academy’s Science and Technology Council.

- Familiarity with computers, operating systems, networks and concepts of 3D graphics in order to provide host organizations with legitimate support for the creation of digital content and assets for feature films.

- Flexible, open, and proactive behavior; as well as the willingness to meet challenges as they arise.

- Participation in industry conferences, special events, seminars, festivals, Academy membership screenings and events; and general assistance as needed.

- Completion of the participating host’s in-house training coursework (as required), including third party and proprietary production software, tools, and methods used in production.

- Interns must sign a standard nondisclosure agreement and adhere to all participating host policies.

- Interns are required to complete up to three internship program evaluations.

- Interns are required to complete up to three internship assignments, including a final report due upon completion of the internship, for review by the Science and Technology Council Internship Program Committee and hosts.

I have read and agree to all of the expectations listed above.

__________________________
Signature (Student)

__________________________
Please print name and school

__________________________
Date