



A dynamic innovative economy needs a robust education system that encourages graduates to pursue technical degrees and entrepreneurial paths. Recognizing this need, Intel® Higher Education in India strives to nurture innovators through multiple platforms. We recognize that academia plays a pivotal role in nurturing high-quality talent and skills and promoting research and innovation. The Intel® Higher Education Program in India collaborates between Intel and leading engineering and research institutions, universities and the government to work towards the advancement of university curricula, research engagements, faculty developments and innovation. So far, Intel's Higher Education program has reached over 2,35,000 students and 4,500 faculty members across more than 750 institutions.

The Intel PhD Fellowship Program awards fellowships to exceptional PhD candidates pursuing cutting-edge research in the "focus areas" identified by Intel Technology India Pvt. Ltd. This is a prestigious and highly competitive program with a limited number of fellowships awarded annually to Indian students to pursue PhD in reputed technology and research institutions in India. Recipients of the fellowship will work with their mentor to develop a deep understanding of the technological issues facing the industry and stay at the forefront of solving the most complex technological problems that lie ahead.

Recipients of the fellowship may be provided internship opportunities at Intel Technology India Pvt. Ltd. Selected PhD candidates will be awarded a fellowship of upto Rs.6,00,000/PA including travel grant and contingency grant for a period of upto 4 years.

Technology Focus Areas

Artificial Intelligence is deeply embedded in the world around us and is poised to transform industries across the board. Intel is committed to leading this transformation and work closely with research community to accelerate the process. To that end, we are seeking breakthrough research proposals in following areas with span as applications, algorithms and system design

- Neural Turing Machine and Never Ending Learning
- Differentiable Neural Computers
- Reinforcement Learning
- Anomaly Detection, Zero/One Shot for real-time safety critical applications
- Unsupervised Learning + Reasoning
- Challenging Computer Vision tasks
- Deep Learning on Large Graphs
- Combining Deep Learning with other verticals like Science, Genomics, Health for breakthrough applications
- Light Weight Neural Networks
- Distributed deep learning training on HPC, cloud, and mobile networks
- Understanding Context, Emotions and integrating into human society seamlessly
- Going beyond visible spectrum

Some illustrations and specific references below –

AI enabled Context Awareness

Context awareness and context inference has come a long way from using one or more sensors, sensor fusion, and finally now using multiple sensed data and applying ML/DL techniques to infer key actionable insights that are otherwise unknown to a computing system. Apart from fundamental research on context inference, this opens up a variety of avenues of research such as how to sense information without compromising privacy, distributing the machine learning from the client device to the back end etc. Intel is interested in research in the following areas but not limited to them:

- Context inference through techniques such as federated learning (distributed learning, differential privacy)
- Machine understanding of humans (multi-modal input, emotions, social settings)
 - Inference of human emotions
 - Social context inference
 - Conversation analysis and generation (advanced conversational engines, chatbots)
- Beyond visible sensing (beyond the visible spectrum, much more than the hyper spectral bands)

AI-ML-DL in Healthcare

AI-ML-DL has evolved from the realms of science fiction and academic research into promising technologies that are advancing many fields of engineering and medicine including healthcare. From possibilities of automated screening to high quality advanced diagnosis that improve the effectiveness of the specialists, we are at the threshold of a paradigm shift in healthcare. We encourage budding research minds in premier research institutes in India to avail the Intel Ph.D research fellowships and be part of the new wave research that leads to tangible technologies that can be change agents in healthcare.

Focus areas in healthcare includes screening and advanced diagnosis based on radiological, ophthalmological and pathological images apart from physiological data using deep learning (DL) covering a variety of diseases that are top 10 death agents in India. We are looking for an inference system that can help automate high throughput screening apart from providing high quality advanced diagnosis based on multiple biomedical modalities. Ph.D students will be exposed to Intel's state-of-the-art HPC facilities that can accelerate their research.

Research innovations stems from following challenges we are facing in Indian healthcare context –

1. Cheaper and easier to use DL based automated screening which will see bulk of the patients and hence will have to support high throughput inference
2. DL algorithms that are sensitive to India specific datasets – example, Indian women have [a] higher breast density and that makes it harder to diagnose breast cancer, [b] the youngest breast cancer incident age group 20-30 & [c] aggressive breast cancer at low age

Portability of screening equipment and DL based inference aids to cover length and breadth of the country where there is a huge disparity in rural [70%] versus urban [30%] population spread.

Eligibility

- Nationality: Only Indian Nationals are eligible to submit applications to participate in the Intel PhD Fellowship Program.
- Preference will be given for 3rd and 4th year PhD Students. However students in 1st year and 2nd year too can apply, provided they have strong academic and research credentials.
- Must be currently enrolled in a PhD program at selected universities/institutes with research problem based on topics that are relevant to Intel.
- Must retain full-time student status during the academic year(s) for which the fellowship is awarded.
- Must have successfully completed all qualifying examinations.
- Once selected, students may not defer the fellowship.
- Intel employees and their families are not eligible.
- Nominations from universities will be screened to ensure that the overall eligibility criteria are met.
- Selection is based on candidates' overall potential for research excellence, degree to which their technical interests align with the "Focus Areas", their progress till date, and recommendations from their advisor and Head of Department.
- Selection is based on the student's academic excellence and ability to clearly articulate their research interests.
- Payment of the fellowship award will be made directly to the university/institute.
- Key elements for selection: Candidate's credentials, institute's credentials for the selected field of study, alignment with the Focus Area and academic research guide's credentials.

Important Dates

- Applications for granting fellowship will start from July 2017
- Candidates should submit Application by 15th August 2017
- Results of the selected candidates will be declared by the end August 2017

Affiliations and Government Partnerships

Intel will be keen to partner with any existing Government PhD/Doctoral Studies fellowship programs for further enrichment and expansion of the program.

TERMS AND CONDITIONS

- The student should have a first class education credentials right from Higher Secondary and Secondary Schools.
- 1st year PhD students and students in the beginning of 2nd year PhD can apply.
- Students have to be registered as full-time students in the institute where the PhD registration is sought.
- Intel Technology India Pvt. Ltd. Reserves the right not to grant any PhD Fellowship.
- Intel Technology India Pvt. Ltd. Reserves the right to have a discussion with the student, if deemed necessary.
- Intel PhD Fellowship Program is open for only the Focus Areas mentioned in page above.
- The institute will intimate Intel on the date of filing of any patent related to any invention by the fellow recipient under this program.

- The institute is free to publish any work developed by the fellow recipient, provided it sends Intel a written intimation along with the work that will be published 30 days prior to such publication.
- The Intel PhD fellowship can be taken in addition to the PhD scholarship that the student receives from other sources provided there are no violation of rules.
- Intel will get the first opportunity to consider the candidate for any employment opportunity, if any, within Intel.

Frequently Asked Questions

What is the Intel PhD Fellowship Program?

The Intel PhD Fellowship Program awards fellowships to exceptional PhD candidates pursuing cutting-edge innovation in hi-technology fields. Intel Corporation has been offering this program in the US for more than two decades and this prestigious program has become highly competitive with a limited number of fellowships awarded annually.

We at Intel Technology India Pvt. Ltd. (Intel) are pleased to bring this program to India to encourage a high impact transformative research collaboration between academia and industry, to provide selected students an opportunity to work with the best minds in the selected areas of research.

What are the unique elements of this Program?

Each award recipient is assigned to an Intel technical mentor who is a respected leader in a said field. Students work directly with their mentors to develop a deeper understanding of relevant technical issues and contribute to solve the complex technical problems facing the industry. Award recipients may be considered for internships and hiring opportunities within the company.

Through the research grant, the award recipients work closely with their respective mentors, meet and network with top industry researchers at selected Intel campuses during the academic year immediately following the award. The goal of these sessions are to provide each student with an opportunity to showcase their research, identify potential industry-academic collaborations, and explore internship opportunities.

Can students directly apply to Intel for the PhD Fellowship Program?

No. Students cannot directly apply for the Intel PhD Fellowship Program. Intel will be inviting proposals from faculty members of select technology institutions and applications are to be routed through the research guides.

When is the last date for submission of application forms? When will the results be declared?

Please check with an Intel Representative for detailed information on form submission and results declaration.

Can a Professor/research guide apply for the Intel PhD Fellowship before identifying a student for PhD?

Yes. A Professor/research guide from an institution selected by Intel for the Intel PhD Fellowship Program can submit a proposal without a student being identified. However, the research guide has to provide the details of the student at a later date to Intel. The review committee will once again review the proposal, based on the details of the student's educational qualifications and other credentials as per the terms and conditions of the Intel PhD Fellowship Program, and make a decision on awarding the Fellowship.

Are award recipients guaranteed a job in Intel?

No, the Intel PhD Fellowship Program will not guarantee a job at Intel to the award recipients. However, Intel may give hiring preference to the award recipients if they chose to pursue their career with Intel.

Will Intel do a performance review of the Fellowship? How frequently?

Each award recipient shall be associated with a mentor from Intel who is an established researcher in a given domain. The student shall be in touch with the Intel mentor on a regular basis during the tenure of the Fellowship. There will be quarterly reviews to track progress, and additionally, the candidate has to submit an annual progress report to the PhD Fellowship Committee for review and approval for funding for the next year.

Will Intel mentors be co-authors of research papers arising from the research through Fellowships?

Yes, Intel mentors can be co-authors to research papers at their discretion. As the focus of the Fellowship is to encourage outstanding technical research, Intel will aim to publish the research papers in renowned publications and conferences.

What will happen if an award recipient gets a better job offer and would like to discontinue the Fellowship?

It is not binding on the student to continue with the Fellowship. A student can apply for discontinuation of the Fellowship by providing strong reasons justifying the same, recommendation and support of the research guide for the discontinuation and sufficient notice period before the Fellowship can be terminated.

What are the key elements for selection of a candidate?

The key selection criteria include:

- Academic credentials of the students
- Proven track record and expertise of the research guide in the area / domain
- Engineering and research goals
- Relevance of research topic

Can the research area and guide be changed at a later date?

Yes. On the basis of adequate justification, the student's research area and/or research guide can be changed. However, continuation of the fellowship will be subjected to further review by the Intel PhD Fellowship Committee.

Can the scholarship be taken in addition to other scholarships that the student is receiving?

Yes. The Intel PhD Fellowship can be taken in addition to other scholarships, provided the Institute's own PhD program rules and regulations permits it and the terms and conditions of the scholarship from other sources are not violated.

How do I send in my applications for the Intel PhD Fellowship Program?

Applications for the scheme should be routed through the research guide in the format provided by Intel with a covering letter from the research guide. The application form duly completed with necessary support documents should be emailed in PDF format to Intel.

To whom should the applications be sent?

Applications should be sent by email to Udian Patel at Udian.patel@intel.com

FORMAT FOR APPLICATION TO THE INTEL PHD FELLOWSHIP PROGRAM

SECTION 1: STUDENT DETAILS*

Applicants Full Name	<input type="text"/>	Date of Birth	<input type="text"/>	<input type="text"/>	<input type="text"/>
Institute Name	<input type="text"/>				
Current Address	<input type="text"/>				
Permanent Address	<input type="text"/>				
Contact Details	Work Phone:	<input type="text"/>	Email:	<input type="text"/>	
	Mobile:	<input type="text"/>			
Educational Qualifications	Year of Passing	Board/Institute /University	% of Marks	Class Obtained	Specialization (If any)
Secondary School	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Higher Secondary	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Undergraduate Studies	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Postgraduate Studies	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Detailed CV	Enclose detailed CV of the Student				
Recommendation Letters	Enclose up to 3 recommendation letters				

*Professors applying without student details can skip section 1 and provide the student details later.

SECTION 2: RESEARCH GUIDE DETAILS

Full Name	<input type="text"/>
Department	<input type="text"/>
Institute Name with Full Postal Address	<input type="text"/>
Contact Details	Work Phone: <input type="text"/> Email: <input type="text"/>
	Mobile: <input type="text"/>
Key Research Areas	<input type="text"/>
Brief Profile of the Research Guide <i>Not more than 500 Words</i>	<input type="text"/>
PhD Program Joining Date of the Student	<input type="text"/>
Grant Cycle Applied for	Aug 2017

SECTION 3: PROPOSED PHD RESEARCH WORK SUMMARY

Research Area	<input type="text"/>
Research Topics	<input type="text"/>
Title of the PhD Thesis (Tentative)	<input type="text"/>
Summary of the Proposed Research Work <i>Not more than 1000 Words</i>	<input type="text"/>
References (if any)	<input type="text"/>
Additional Information (if any)	<input type="text"/>