Date of Submission	

IPL Project Proposal Form 2017

(MAXIMUM: 3 PAGES IN LENGTH)

1. Project Title: (2 lines maximum)

   Landslide Rapid Mapping from Remote Sensing

2. Main Project Fields

   Select the suitable topics. If no suitable one, you may add new field.

   (1) Technology Development

         Landslide Inventory Mapping

   (2) Targeted Landslides: Mechanisms and Impacts

         A. Catastrophic Landslides

   (3) Capacity Building

         A. Enhancing Human and Institutional Capacities

   (4) Mitigation, Preparedness and Recovery

         B. Preparedness

3. Name of Project leader

   Affiliation: (office and position) Ping Lu, Associate Professor, Tongji University

   Contact: (postal address, fax, phone, email)

   Address: College of Surveying and Geo-Informatics, Tongji University, Shanghai, China

   Fax: +86 21 65981085

   Tel: +86 21 65983911

   Email: luping@tongji.edu.cn

   Core members of the Project

   Names/Affiliations: (4 individuals maximum)

   Tongji University

4. Objectives: (5 lines maximum; what you expect to accomplish?)

   The main objective of this project is to propose an appropriate method that can be directly applied to rapid responses and emergency managements of landslide hazards by developing more reliable and automated methods for inventory mapping from remote sensing imageries.

5. Background Justification: (10 lines maximum)

   In recent years, with the availability of very high resolution (VHR) remote sensing images (spaceborne, airborne, and terrestrial), landslides can be mapped more accurately, completely, and rapidly than ever

before. Numerous semi-automated or automated approaches have been developed for landslide inventory mapping over the past few years. However, their applicability needs to be further verified in different situations, and there is no single method and no single type of remote sensing data practical enough for all types of landslide inventory mapping. In addition, it is currently still difficult to find an appropriate method that can be directly applied to rapid responses and emergency managements of natural hazards. Therefore, there is a need to propose more reliable and automated landslide inventory mapping methods.

6. Study Area: (2 lines maximum; where will the project be conducted/applied?)
The project will particularly focus on Hong Kong where destructive landslides are prevalent in urbanized areas.

7. Project Duration: (1 line maximum)
Three years.

8. Resources necessary for the Project and their mobilization
Personnel, Facilities, and Budgets
Dr. Ping Lu, the associate professor in Tongji University, will lead the research team. The fundamental facilities will include remote sensing images, software and workstations. The budget for three years will be around 60,000 USD.

9. Project Description: (30 lines maximum)
Landslide inventory mapping is an increasingly important research topic in remote sensing and natural hazards. In recent years, the use of multi-temporal remote sensing images makes it possible to map landslides semi-automatically. This project will focus on developing semi-automated approaches for reliable and accurate landslide inventory mapping. Specifically, it consists of two principal methods: 1) the change detection-based thresholding and level set evolution, and 2) a change detection-based Markov random field method. The effectiveness and advantages of the proposed methods will be corroborated by a series of experiments. These methods will be tested, but not limited in a total land area of approximately 40 km^2 in Hong Kong. Compared with the existing LM methods, particular focuses will be given to the following attractive characteristics: 1) to take into account both the spectral and spatial contextual information of landslides; 2) to ensure a great level of automation and 3) to use little parameter tuning and improve the generic methods.

10. Work Plan/Expected Results: (20 lines maximum; work phases and milestones)
1st year: Field investigation, remote sensing datasets collection.
2nd year: Methodology development of level set evolution and Markov random field.
3rd year: Result validation and accuracy assessment.

11. Deliverables/Time Frame: (10 lines maximum; what and when will you produce?)

1st year: Field report and processed remote sensing data.

2nd year: Technical report of methodology: level set evolution and Markov random field.

3rd year: landside inventory map and project report.

12. Project Beneficiaries: (5 lines maximum; who directly benefits from the work?)

Stakeholders such as public department and relevant companies, as well as local inhabitants in Hong Kong, will be the project beneficiaries.

13. References (Optional): (6 lines maximum; i.e. relevant publications)

Note: Please fill and submit this form by 1 September 2017 to ICL secretariat <secretariat@iclhq.org> and ICL network <ICL-network@iclhq.org>