Mapping Southeast Asian Settlement Sites Using Imaging Radar and GIS: A Case Study at Angkor

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Overview: Southeast Asia
Overview: Cambodia’s Great Lake
Local Ecology
Recent Research

A six-year survey of the south of Angkor by the EFEO’s Christophe Potter uncovered Angkor as a lived-in space for the very first time. His study documented a system of house mounds, local shrines, pre-modern field systems and household ponds stretching between the great monumental structures and the water management system. Potter’s maps were initially hand-drawn but were digitised at the University of Sydney’s Archaeological Computing Laboratory (ACL) in 2009.
Recent Research
PACRI M 2 AIRSAR Coverage
Current Map of Angkor
AIRSAR Instrument
Multi-band & polarimetric
Multi-band & polarimetric

CvvLvvPvv (RGB)  LhhLhvPvv (RGB)
Precision elevation model
Key Advantages of AI RSAR:

- Longer bands penetrate foliage
- Interferometric & polarimetric
- Airborne platform = high resolution
- Relatively cheap, fast, single methodology
- Highly sensitive to variations in height, foliage and moisture
Features: Shrines
Features: Shrines
Features: Shrines
Linear Features
Linear Features
Disadvantages of AI RSAR:

- Similar features to aerials
- Easy to miss features that are clearly visible in aerials
- Not intuitive
- Pixel size vs. feature size
Automated feature extraction

- Diversity of surface expressions
- How to identify unknown features?
- Applicability outside of Angkor
- Quality control
Methodological Issues
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Methodological Issues

- Exclusion of recent features
- Need for ground verification
  - Expensive, time-consuming
  - Dangerous
- Temporality
Relative Dating of Structures
Stylistic Dating of Stonework
Spatial Patterning (Pottier)
Settlement Typology (Pottier)
Consolidating Databases
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GeoSAR 2004-2005

- Commercial application, close to release
- Time-sequenced, multiple runs over Angkor
- Potential to uncover and analyse the urban context of other Southeast Asian temple complexes
GeoSAR 2004-2005
Further Information

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