



FIG Working Week 2024

19-24 May

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The Way to Improve Cadastral resurvey project with making Google Street View using 360 Camera

Dongwoo Kim, South Korea
[LX Gwangju-Jeonnam]

Presented at the FIG Working Week 2024,
19-24 May 2024 in Accra, Ghana

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Purpose of Presentation

Suggesting the way to compensate for limitations of decision-making data (such as drone orthophotos) utilized in the Cadastral resurvey project.

Improving the way communicate to make it easier for everyone (non-technic) to understand Cadastral resurvey project.

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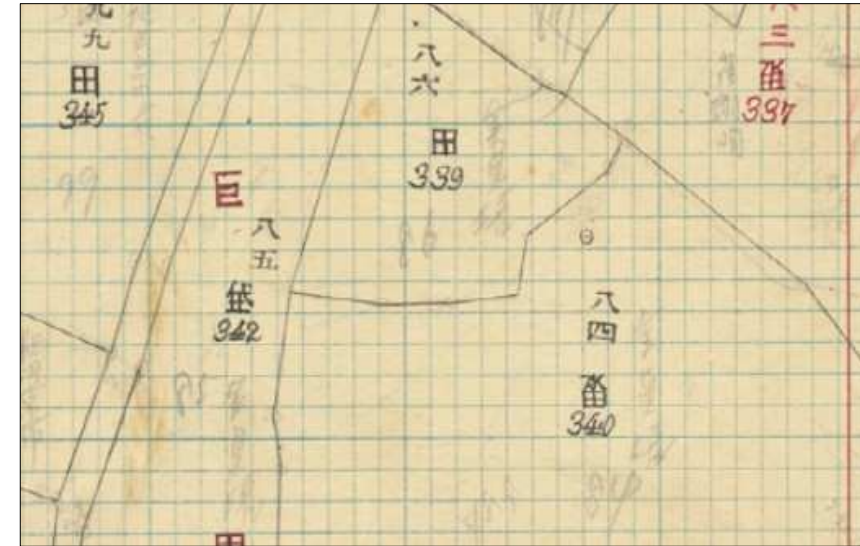
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Origin of South Korea's Cadastral Maps



Land survey project by Japan
(1910~1918)



Cadastral Maps in Korea



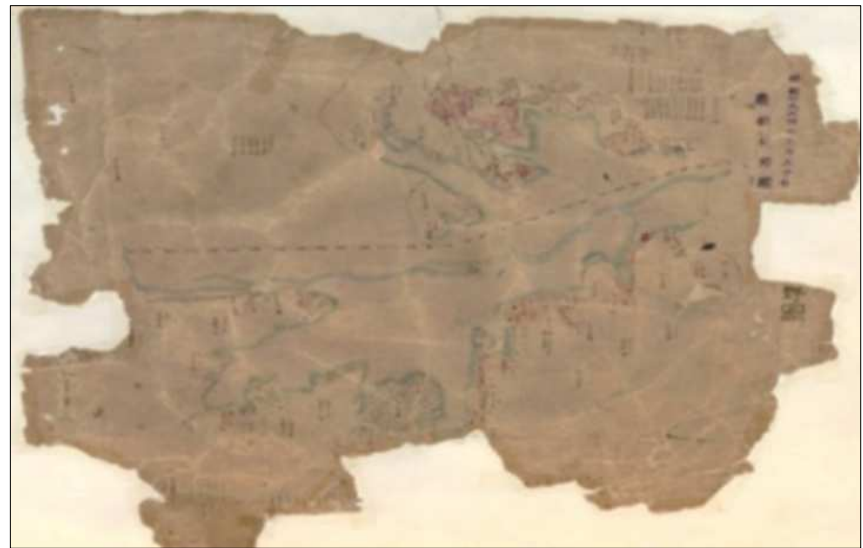
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Digitalization of Cadastral Maps



Damaged Cadastral Maps



Digitalization of Cadastral Maps

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The problem with South Korea's Cadastral Maps



Korean War (1950~1953)

The passage of time, including wars, has created differences in land use between when cadastral maps were created and today. Therefore, The Ministry of Land, Infrastructure, and Transport (MOLIT) wants to overcome this difference and create an accurate cadastral map of current land use.

Cadastral resurvey project (2012~)



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Cadastral resurvey project - using Drone Orthophotos



We can't go to every site to adjust the boundaries every time.

So we use drone orthophotos to compare the cadastral maps to the site and make adjustments.



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Boundary Extraction Impossible cases with drone orthophotos



Hidden by roof



Hidden by vegetation

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Cadastral resurvey project - using Roadview on the portal site



Kakao map Roadview



Naver map Streetview

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Adding Roadview to Korea's website is difficult



- Roadview relies on experts
- This is to say that Roadview image updating should also rely on experts: the images we look to may not be the same as the field as it is now
- Roadview can only shoot roads that the car can drive on



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I wanted to find the answer that satisfies all three

Boundary Extraction Impossible



Complementing vertical images
(Drone Orthophotos)



Make it easy
(not for only experts)



Can shoot around everywhere
(on foot, not just by car)

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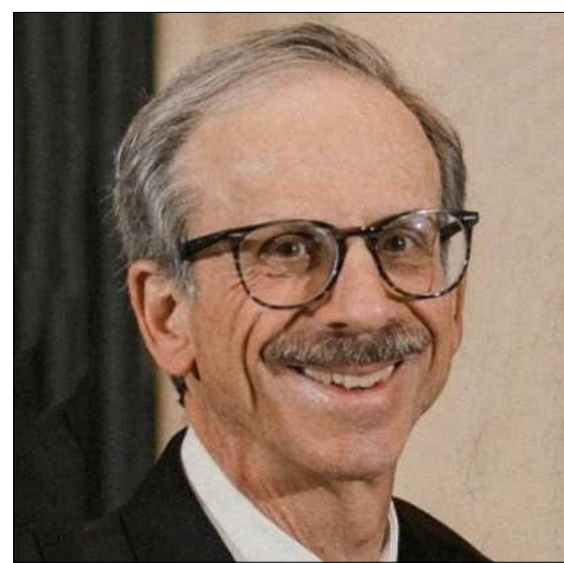
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Dean Zwickel's UL2GSV TOOL (Upload to Google Street View)



Dean Zwickel

(Arlington Heights, IL, United States)

UL2GSV was developed and used for a Google Street View project using the Insta360 cameras.

The suite has since been enhanced and supports other cameras.

The tools are currently available for Windows 10 and MacOS and are easy to use via a file drag-and-drop user interface.

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Introducing shooting equipment



Insta360 One X2

360-degree video camera
Up to 5.7K@30fps resolution
149g ultralight equipment

+

GPS Smart Remote

Video GPS location tracking
Camera remote control



Cost almost \$700



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Mosan3 District, Hwasun-gun, Jeollanam-do

The target area is 83,540 m² , about 380 parcels (including paddy fields and residential areas)

Two-person team, consisting of a shooter and an assistant, handled video shooting and guidance via the map, respectively

It took about 3hours

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Get the original video (.insv) file from the Insta360 camera

Get all human walkable paths, including rice paddies



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Process for creating Google Street View

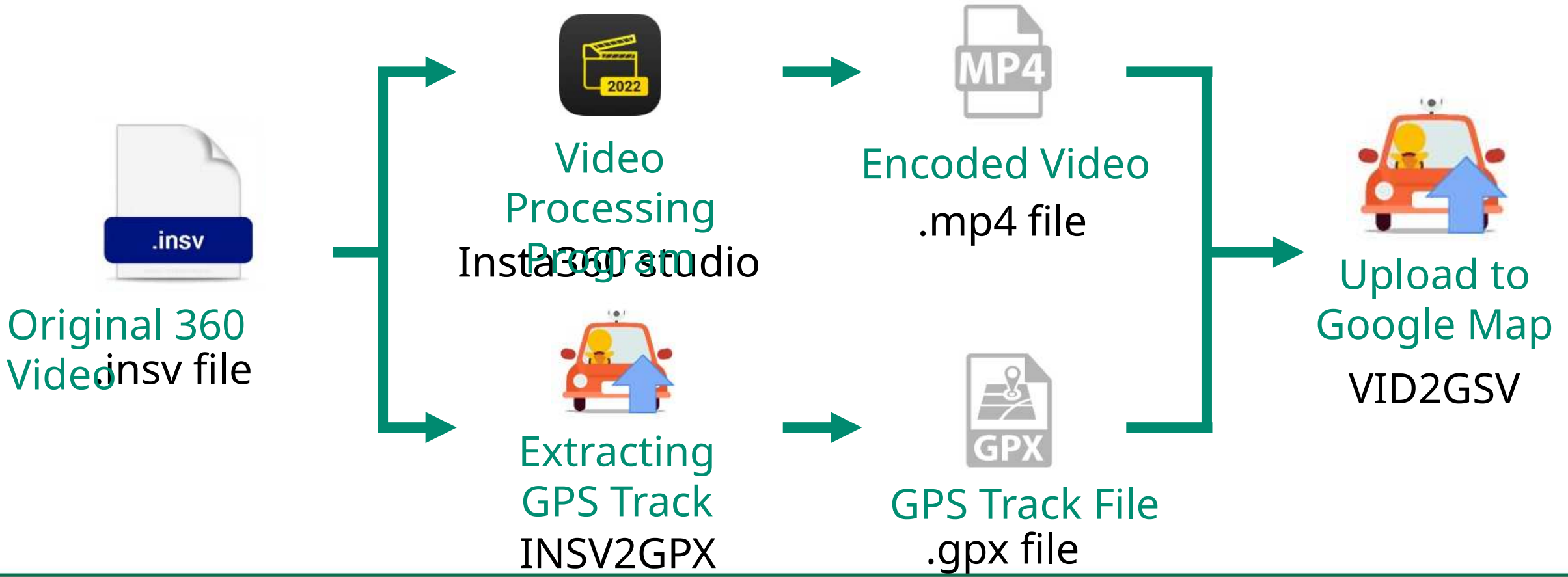


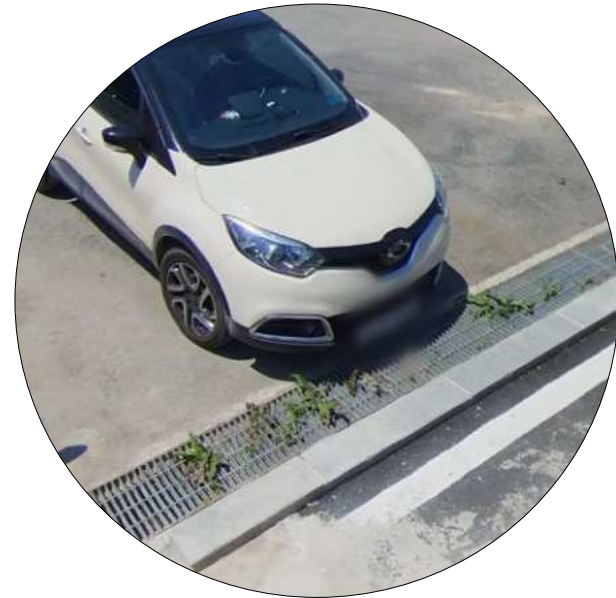


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Vehicle license plate



Face

Automatically blurred personal information



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In contrast to regular road views, can get images not only from roads traveled by cars,

but also from fields (anywhere we can walk on)



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Areas to check



Areas not visible
in drone orthophotos

See at human eye level in Street View



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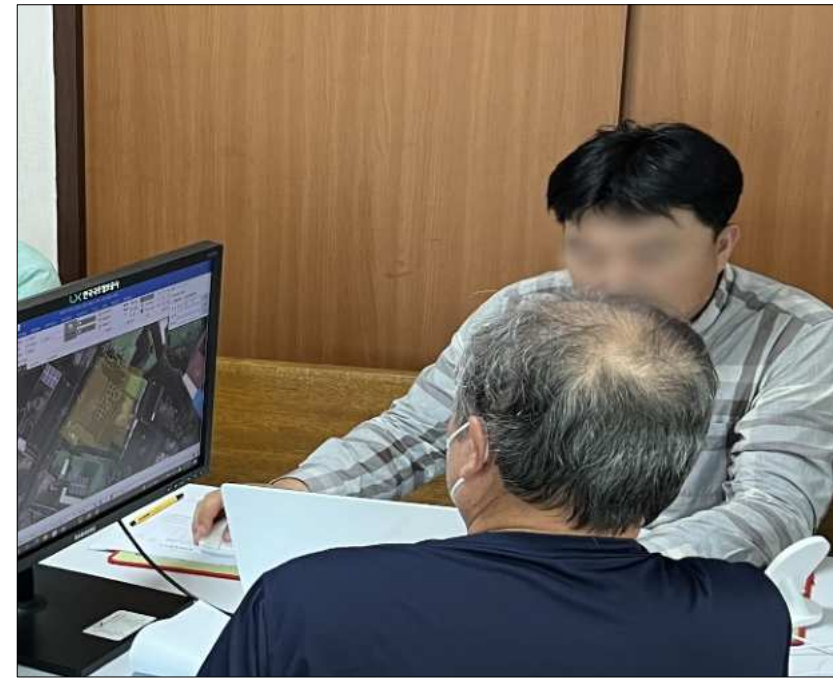
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Efficiency for Surveyors (especially in South Korea's cadastral resurvey project)



Reduce work hours with
always-available maps



Public-friendly
Survey description



Get quality work
from a variety of sources



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“A picture is worth a thousand words.”

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Thank you

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 - [LX Gwangju-Jeonnam]

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SUSTAINABLE DEVELOPMENT GOALS

International Federation of Surveyors supports the Sustainable Development Goals

Commission

#7 Cadastre and Land management

Serving Society for the Benefit of People and Planet

