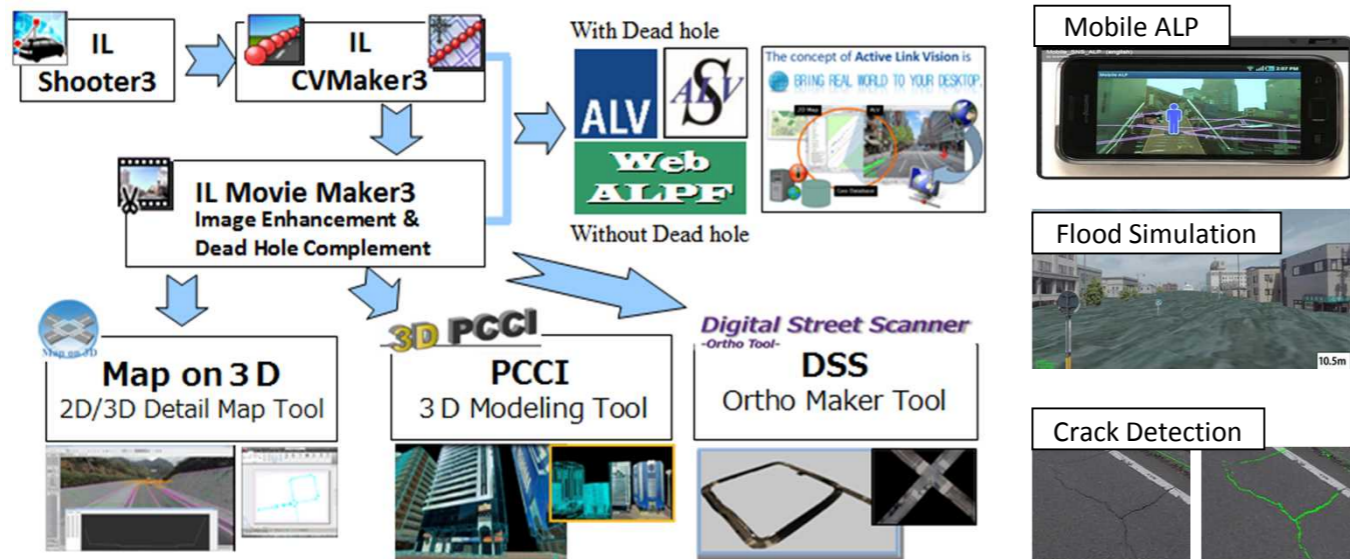


## Higher Absolute Accuracy

Combined with High Accurate	Standard Deviation (1km)			Correction by GCP (1 point every 100 m) for non-GPS	Standard Deviation(1 km)		
	X(m)	Y(m)	Z(m)		X(m)	Y(m)	Z(m)
	0.045	0.048	0.039		0.060	0.061	0.064

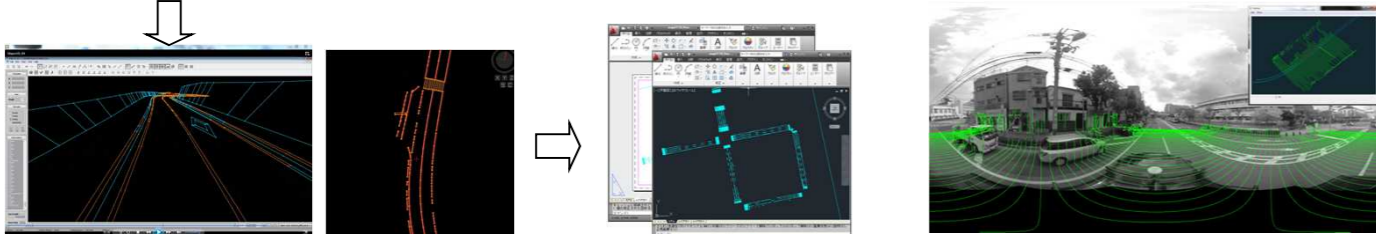
## Software Flow & Fruitful Application



## Map on 3D to produce 2D/3D Detailed Map (1/500 Scale)



- Extract white lines and road edges automatically
- Extract other white marks semi-automatically
- Unique interface to draw & edit on imagery
- Output basic 3D map to CAD application to complete detailed maps
- Available to scan the road surface to make lateral profile.

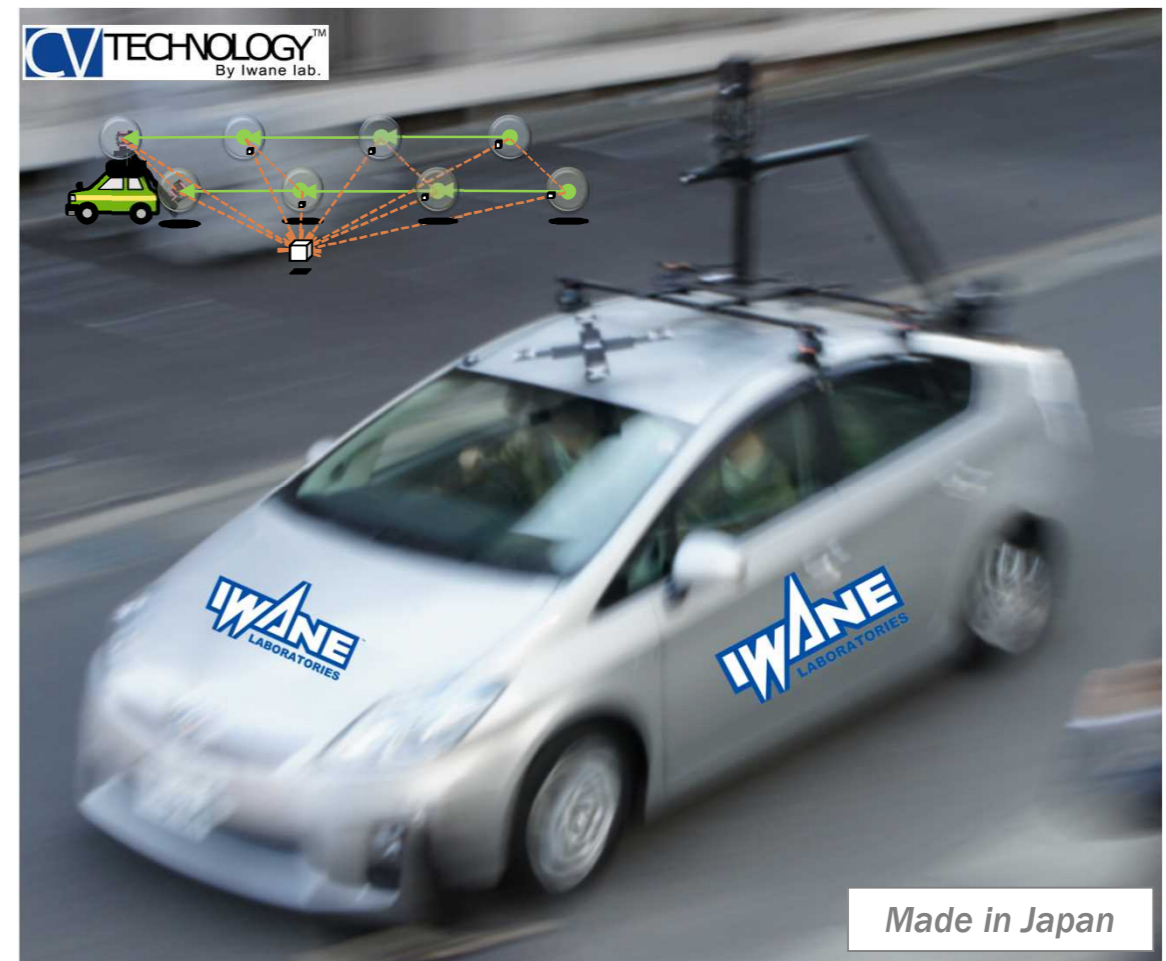


## Expansion Models based on Optical Flexibility



# IMS3 DualCam IMS3

**Image based Mobile Mapping System (MMS) with Simple Configuration & High Accuracy!! based on Advanced Image Processing Technology**



- Simple & Robust
- Easy Operation
- Higher Accuracy
- Fulfilling Application
- Easy Updating
- Potential Expansion



Iwane Laboratories, Ltd.

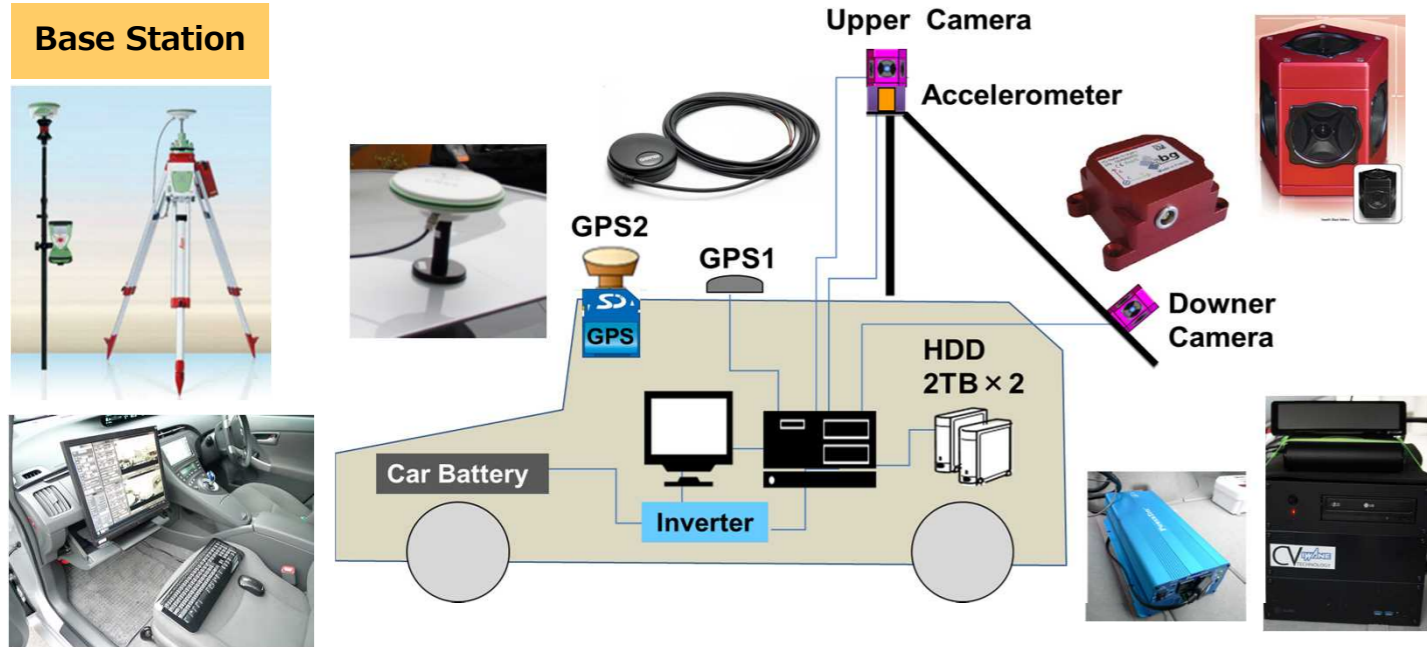
[ Head Quarters ] +81-(0)11-643-0872  
7-8-3 Maruyamanishi-machi, Chuo-ku, Sapporo, Japan

<http://www.iwane.com/en>  
sales@iwane.com

[ Tokyo Branch ] +81-(0)3-5550-9872  
[ Iwane Gulf Branch (Dubai) ] +971-(0)4-433-2889  
[ Iwane Thailand ] +66-(0)2-655-5135  
[ Iwane Korea ] +82-(0)2-3453-8555



# Easy Operation, Simple & Robust Configuration without IMU/Laser

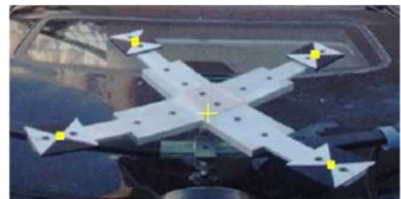


Surrounding Camera Ladybug 3	
Pixel	CCD 1/1.8" x 6
Resolution	2.0 MPiX: 1600(H) x 1200(V) PIXEL x 6 Max 5400 x 2700 PIXEL
A/D	12-bit ADC
Frame	Max 16 FPS (in case of JPEG)
Temperat	0°C~45°C
Size	134(D) x 141(H)mm
Weight	2,416g

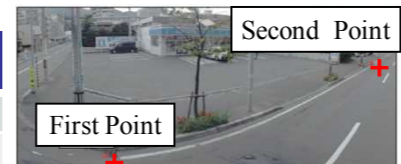
Accelerometer	
Axis	3 axis
Range	±1.7 G
Sensitivity	1200 mV/G
0 Point Drift	±0.03 G (0~70°C)
Temperature	-40~+85°C
Size	44.5(W) x 27(D) x 20(H)mm
Weight	23g + Cable 23g, Total 46g

Time Synchronization GPS	
Receiver	12 Satellite Parallel Receive
Accuracy(WAA)	3m (RMS 95% typ)
1PPS Accuracy	1Hz Puls, +/- 1 μ Sec
Temperature	-30~+80°C (Antenna)
Size	61(D) x 19.5(H)mm
Weight	160g

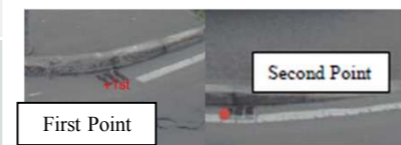
IMS3 Controller PC for Capturing	
OS	Windows®7 (32bit)
CPU	Intel® Core i7 or more
RAM	4GB
Graphics	OpenGL1.2 or more NVIDIA® GeForce GTS250 or more VRAM 256MB or more
Board	IEEE1394b x 2 (Camera connection) e-SATA(USB3.0) x 2 (HDD connection)



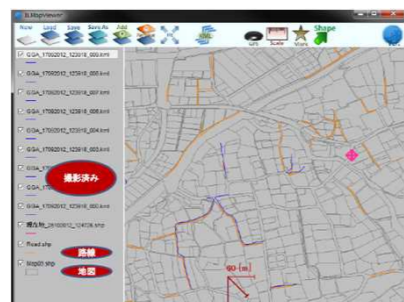
Easy calibration to use helicopter to fix the GNSS position correctly



Calbration between 2 cameras by clicking 2 points which distance is over 30 m.



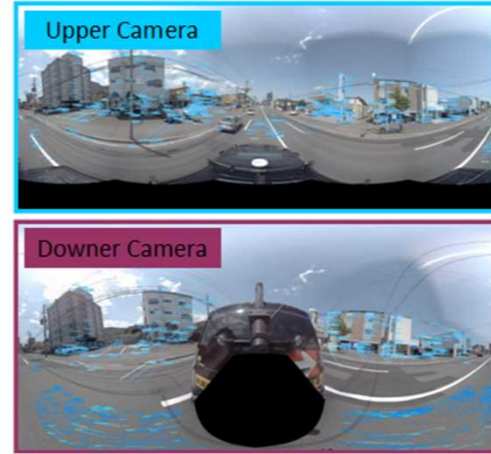
# [IL Shooter 3] Control Dual Cameras and Sensors efficiently



Plan today's shooting courses previously and check them after shooting on the map

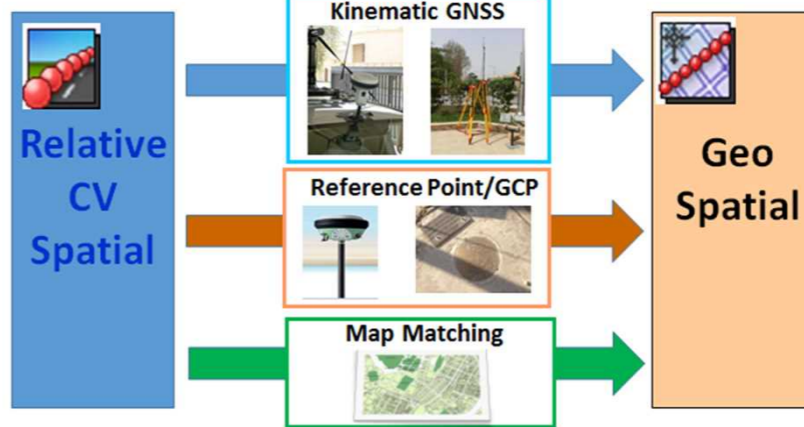
- No need much preparation like driving figure 8 before shooting
- Less than 60 km/hour driving
- 1 staff (driver) can capture at minimum
- Data capacity 3-5 GB/km
- Can shoot for 4-500km by 2 sets of 1TB HDD

# [IL CV Maker 3] Quicker Dual CV Analysis

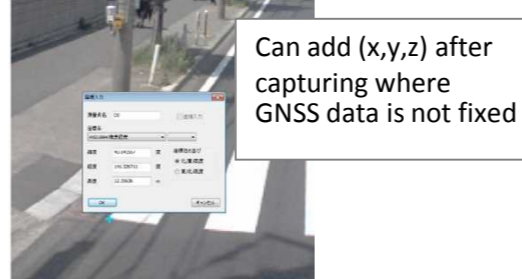


## 【Automated Process】

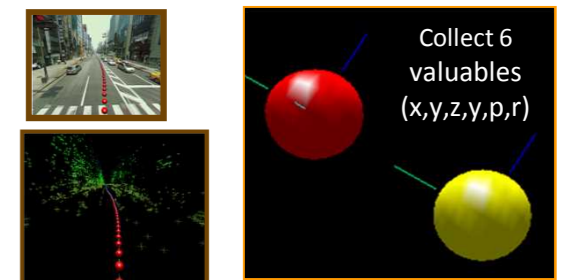
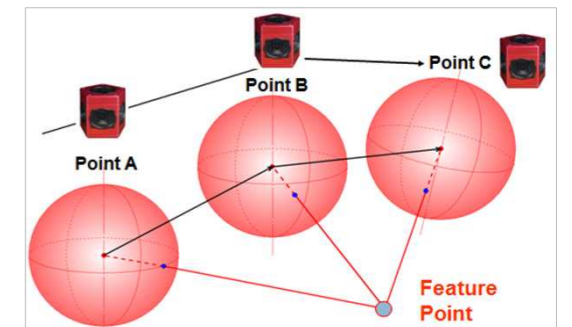
- 1) Extract 2-500 feature points in every frame of stream imagery from the both camera
- 2) Tracking above feature points as long as possible
- 3) Calculate 3D position & posture (Camera Vector) of the two camera
- 5) Integrate Camera Vector figure with sensor (GNSS) Data



## 【Manual Process】



# CV TECHNOLOGY™ By Iwane lab. Human like Analysis of Camera Vector (X,Y,Z,Y,P,R) Image based IMU/Kalman Filter

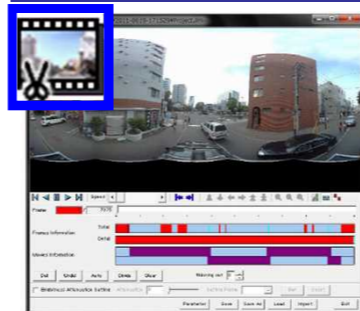


Data processing time for 1,500 frames  
- 45 minutes for CV calculation  
- 45 minutes for Image Enhancement using recommendation PC

## PC Specification for CV Calculation by ILCVMaker3

OS	Windows®7 (64bit)
CPU	Intel® Core i7 or more
RAM	8GB or more
Graphics	OpenGL1.2 or more NVIDIA® GeForce GTS250 or more VRAM 256MB or more
HDD	100GB or more (including work space)
Board	USB x 1 ( for USB Key )

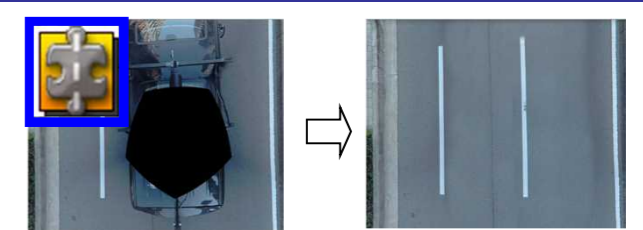
# [IL-Movie Maker 3] Editing & Dead Hole Complement



Automated editing to delete same frames in red



Image enhancement to adjust brightness



Dead hole complement by pasting appropriate frame automatically to make perfect surrounding image without dead angle