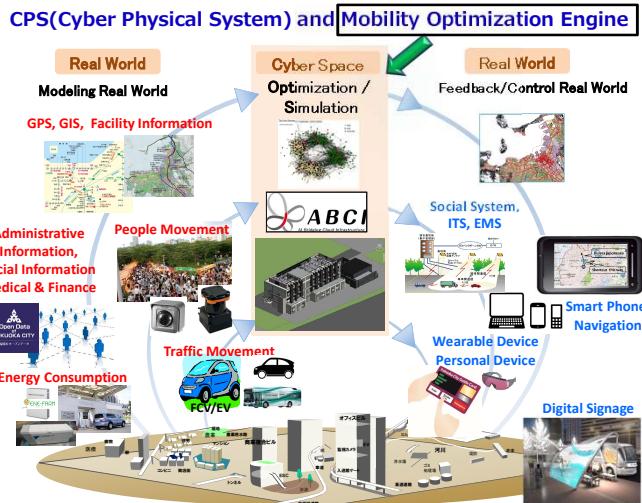
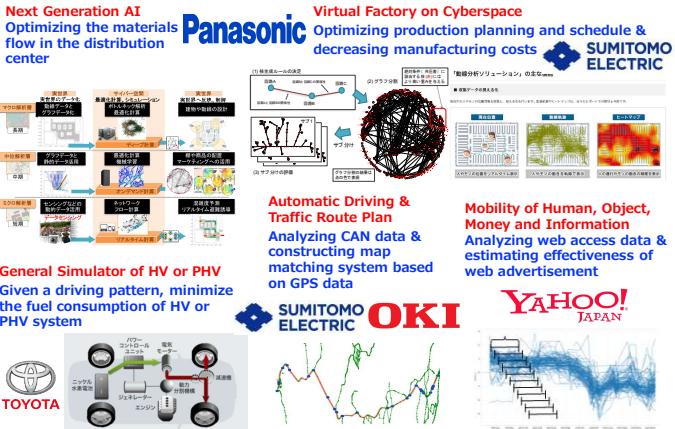


## CPS(Cyber Physical System) and Creating New Industrial Applications on ABCI

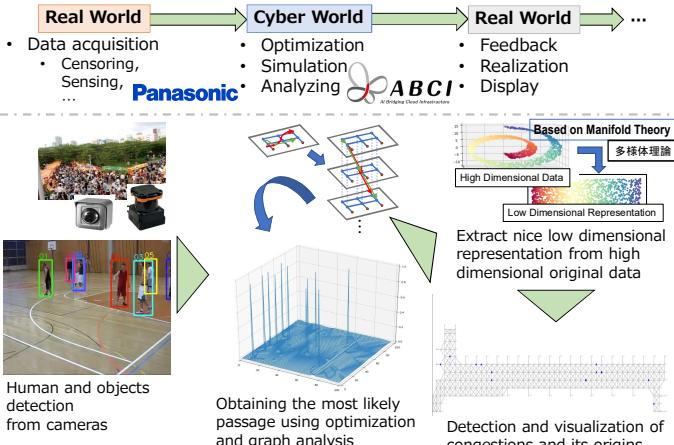
- Gather a variety of data sets using monitoring technologies
- Apply optimization, simulation and deep learning techniques to the real world data
- Collaborative research **Panasonic** **TOYOTA** **NTT** **YAHOO! JAPAN** **SUMITOMO ELECTRIC**



### Cyber-physical System and Industrial Applications of Mobility Optimization Engine



### Cyber Physical System(CPS) & Mobility Optimization Engine

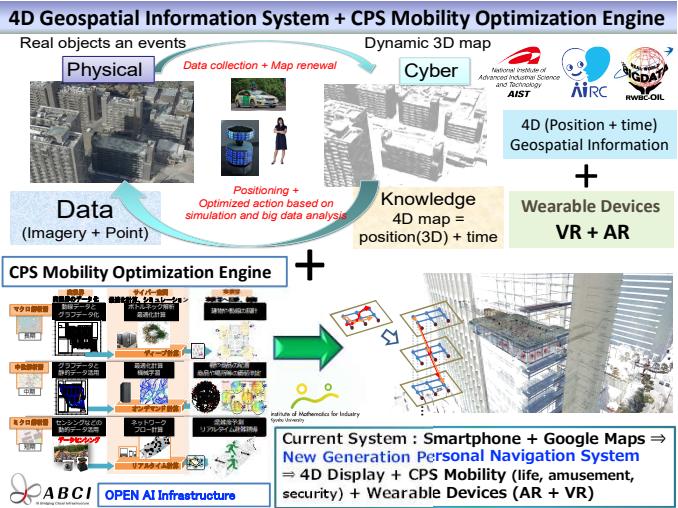
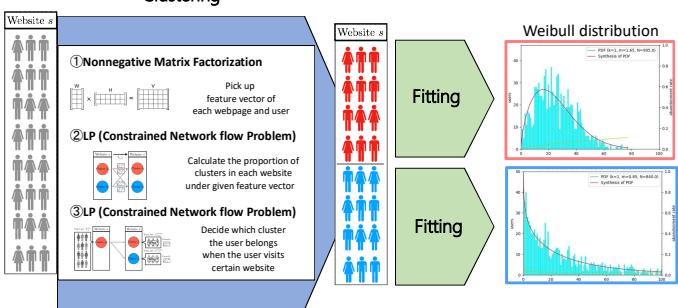


### Proposing New Website Performance Metric by Obtaining How to Change User's Interest

#### Analyzing Web access data & Estimating effectiveness of Web advertisement

With extremely large scale of access data gathered by **YAHOO! JAPAN**  
 [1]Clustering users under considering users' interest each website by 3 optimization problem  
 [2]Fitting user's time on website to single weibull distribution every cluster and website

#### Clustering



**ABC I** CPS Mobility Optimization Engine on ABCI  
 •AI(Deep Learning), Graph Analysis, Mathematical Optimization (LP, MILP, SDP, etc.)  
 => Chainer(Chainermn), Caffe, Tensorflow, Keras, SDPARA etc.

### Basic Requirements for AI Cloud System

BD/AI User Applications			
Machine Learning Libraries	Graph Computing Libraries	Deep Learning Frameworks	Web Services
Numerical Libraries BLAS/Matlab	BD Algorithm Kernels (sort etc.)	Fortran: C+ C++ Native Codes	
MPI • OpenMP/ACC • CUDA/OpenCL			
Parallel Debuggers and Profilers			
PFS Log OPFS	DFS HDFS	RDB PostgreSQL	CloudDB/NoSQL Memcached/Redis
Batch Job Schedulers	Workflow Systems	Resource Brokers	SQL Hive/Pig
Linux Containers + Cloud Services			
Linux OS			
OS			
Hardware			
✓ Modern supercomputing facilities based on commodity components			

