



مباني مدل سازي اکوسیستم هاي مرتعي

دکتر حسين بشري

پاييز 1389

هدف دوره

■ چگونه در اکوسیستمهای مرتعی مدل بسازیم و از آن استفاده کنیم؟

■ چگونه مدلها می توانند ساخته بشوند؟

■ چگونه ویژگیهای مدلها می توانند بررسی بشوند؟

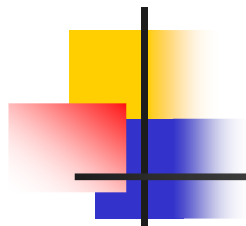
■ چگونه يك کارشناس می تواند از مدلها استفاده نموده و به دنبال آن نتایج مدل را بررسی نماید؟





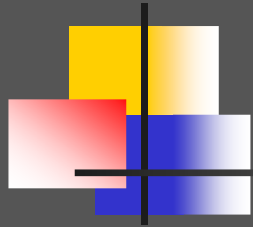
این جلسه

- مدل چیست و چه اهمیتی دارد
- داده ها



کیمیا داری که تبدیلش کنی

گرچه جوی خون بود نیلش کنی



**Raw
Data**

داده خام

process



**Modeling
Tools**

مدل ها

analyze



**High priced
information**

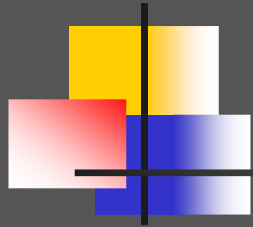
اطلاعات ارزشمند

Policy

سیاست گذاری

Decision
making
process

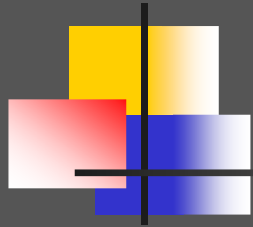




**Basic
Data**

**Modeling
Concepts**

**High priced
information**



Basic Data

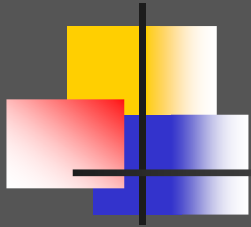
... Any successful national policy requires a solid database behind it

OECD (Organization for Economic Co- operation and Development)

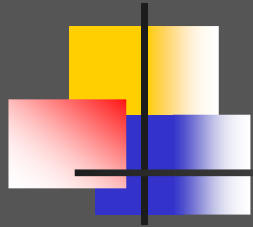
.... A solid database is needed to support decision making in an increasingly complex and environmentally stressed world

GEOSS (Global Earth Observation System of Systems)

Basic Data



Ensure that all data products are available to any user at no more than the cost of fulfilling user requests. This means that data centers will not price data based on the recovery of capital costs or other assets previously paid



Basic Data

The Federal Office of Topography (**swisstopo**) is a modern production organization with nearly 270 employees.

Swisstopo creates and maintains the basic geodetic, topographic and geological data for the whole of Switzerland, publishes the national map series at a variety of scales and keeps them up to date.

Swisstopo

Homepage > Products

[Print this page](#)

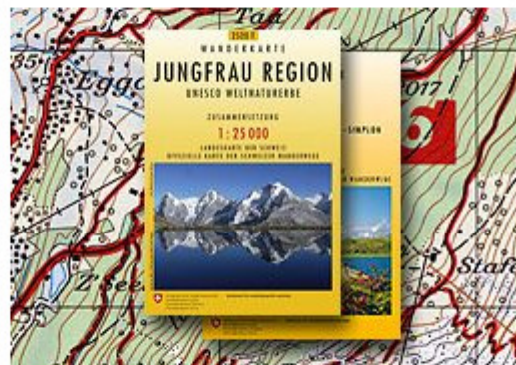
Search swisstopo

Search

[Advanced search](#)

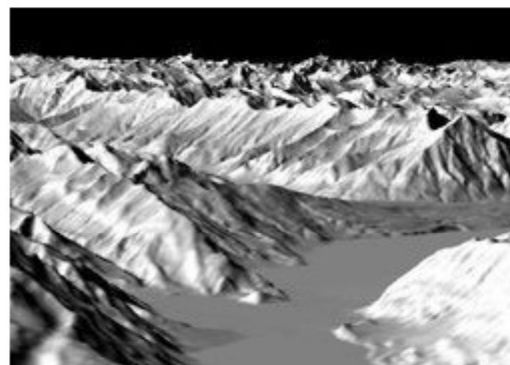
Products

Hiking Maps



With lots of detail and extremely accurate, the hiking map is just what you need for trips and walks out in nature.

DHM25 digital elevation model



For nationwide applications requiring high accuracy.

■ [DHM25](#)

SwitzerlandMobility, the national network for non-motorized traffic on the iPhone



Aerial and satellite images

■ [toposhop](#)

New products

- [Swiss Map Mobile 2009 iPhone, Windows and Symbian Edition](#)
- [plan&go! Hiking Maps](#)
- [Swiss Map 50 v4](#)
- [Swiss Map Mobile](#)
- [Ski tour maps](#)

Data for free use

[SWISSIMAGE Calender 2010](#)
Size: 5043 Kb | Type: ZIP

[Landsat Mosaic, Resolution: 500m](#)

This data can be used free of charge, but only with the indication of the copyright:
Satellite Image: © ESA / Eurimage / swisstopo, NPOC

Size: 1157 Kb | Type: ZIP

Publications



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INSPIRE DIRECTIVE

In Europe a major recent development has been the entering in force of the INSPIRE Directive in May 2007, establishing an infrastructure for spatial information in Europe to support Community environmental policies, and policies or activities which may have an impact on the environment.

INSPIRE is based on the infrastructures for spatial information established and operated by the 27 Member States of the European Union. The Directive addresses 34 spatial data themes needed for environmental applications, with key components specified through technical implementing rules. This makes INSPIRE a unique example of a legislative "regional" approach.

Legislation

Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) was published in the official Journal on the 25th April 2007. The INSPIRE Directive entered into force on the 15th May 2007

To ensure that the spatial data infrastructures of the Member States are compatible and usable in a Community and transboundary context, the Directive requires that common Implementing Rules (IR) are adopted in a number of specific areas (Metadata, Data Specifications, Network Services, Data and Service Sharing and Monitoring and Reporting). These IRs are adopted as Commission Decisions or Regulations, and are binding in their entirety. The Commission is assisted in the process of adopting such rules by a regulatory committee composed of representatives of the Member States and chaired by a representative of the Commission (this is known as the Comitology procedure).

- [Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community \(INSPIRE\) 14.03.2007](#)
- [INSPIRE Metadata Regulation 03.12.2008](#)
- [Commission Decision regarding INSPIRE monitoring and reporting 05.06.2009](#)

- Establish an infrastructure for spatial data in Europe to support environmental policies



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About INSPIRE

What is the INSPIRE Directive?

The INSPIRE directive came into force on 15 May 2007 and will be implemented in various stages, with full implementation required by 2019.

The INSPIRE directive aims to create a European Union (EU) spatial data infrastructure. This will enable the sharing of environmental spatial information among public sector organisations and better facilitate public access to spatial information across Europe.

A European Spatial Data Infrastructure will assist in policy-making across boundaries. Therefore the spatial information considered under the directive is extensive and includes a great variety of topical and technical themes.

INSPIRE is based on a number of common principles:

- Data should be collected only once and kept where it can be maintained most effectively.
- It should be possible to combine seamless spatial information from different sources across Europe and share it with many users and applications.
- It should be possible for information collected at one level/scale to be shared with all levels/scales; detailed for thorough investigations, general for strategic purposes.
- Geographic information needed for good governance at all levels should be readily and transparently available.
- Easy to find what geographic information is available, how it can be used to meet a particular need, and under which conditions it can be acquired and used.

Geographic information created, collected, governed to be shared with all available and transparent



The Global Earth Observation System of Systems (GEOSS)

2009-2011 Work Plan

GEOSS themes:

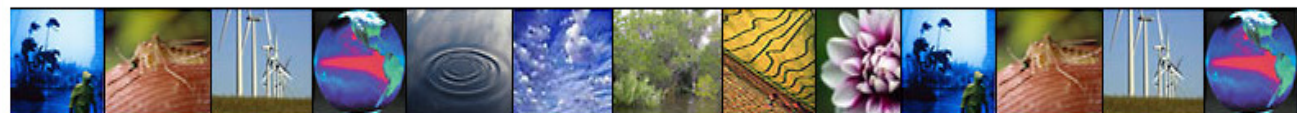
- Disasters
- Health
- Energy
- Climate
- Water
- Weather
- Ecosystems

GEOSS Common Infrastructure

- GEO Portal
- Components Registry
- Standards Registry
- Best Practices Wiki
- Task Force

Data Sharing Principles Implementation

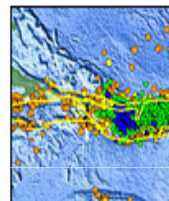
Home



Are you new to GEO and GEOSS? Find out more [here](#)!

GEOSS on-line

Scroll below for a sampling of GEOSS information resources; more sites can be found [here](#).



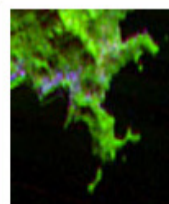
Haiti Supersite highlights critical earthquake information

Initiated by the geohazard scientific community as a contribution to GEO, the Supersites provide easy access to Earth science data and information on natural hazards in geologically active regions. In light of the recent tragedy in Haiti, the Haiti Supersite has been updated with seismic maps, damage maps, topography data, visible and infrared images, [interferograms](#), and useful links. See <http://supersites.unavco.org/haiti.php>.



GEO Forest Carbon Tracking portal now live

The portal for the GEO Forest Carbon Tracking (FCT) Task was launched at the GEO-VI Plenary meeting in Washington DC and can now be viewed on-line at www.geo-fct.org. The portal allows users to visualize the FCT National Demonstrators, the relevant Validation Sites and the inventory of the coordinated acquisitions of satellite and in-situ data; maps and information resulting from the processing of the data will also be posted here when available. A [three-](#)



INPE reaches mark of 1 million images distributed free

A pioneer in the distribution of cost-free satellite images, Brazil's National Institute for Space Research (INPE) announced that it has distributed one million images, more than 70% of which come from the China-Brazil Earth Resources Satellite (CBERS) program. For more details see the news clipping [here](#).



Announcing release of Global Digital Elevation Model (DEM)

Japan's Ministry of Economy, Trade, and Industry (METI), the US Geological Survey (USGS) and the US National Aeronautics and Space Administration (NASA) released the ASTER GDEM on 29 June. By providing a well validated, high-resolution global topography framework, the GDEM is major step forward for both research and operations that depend on Earth observations. For more information, see press releases [here](#), [here](#) and [here](#).

What's new?

GEO newsletter

GEO News Issue #8
(28 April 2010)

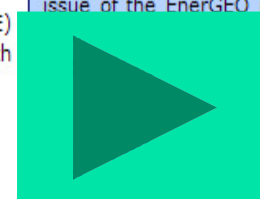
News

GEO participates in Shang

The [MeteoWorld Pavilion](#) was unveiled on 9 May by the Meteorological Organization, Adm EUMETSAT and GEO at the Expo Park, Shanghai, China [story](#)

EnerGEO launches newsle

As reported earlier in GEO, the Environmental Impact of Climate Change started last November with support from the European Commission. The first issue of the EnerGEO newsletter is now available [please](#)



The Japan Aerospace Agency (JAXA) has provided ALOS/PALSAR satellite data to international scientists who support the emergency

[Background and
recommendations]

• Core
Geo-Database

• Remote Sensing

• Interoperable
Services

• Map Production
Guidelines

• Global Navigation
Satellite Systems

• MySDI Initiatives

• **UNSDI**

United Nations Spatial Data Infrastructure - UNSDI

At its 9th annual meeting on 5-7 November 2008 in Vienna, Austria, the United Nations Geographic Information Working Group (UNGIWG) endorsed the "Ninth UNGIWG Plenary Resolution".

RESOLUTION BY THE 9TH PLENARY MEETING OF THE UNITED NATIONS GEOGRAPHIC INFORMATION WORKING GROUP IN SUPPORT OF THE DEVELOPMENT OF A UNITED NATIONS SPATIAL DATA INFRASTRUCTURE (UNSDI)

Introduction

Whereas the United Nations Geographic Information Working Group (UNGIWG) brings together the Geographic Information Systems (GIS) specialists and cartographers of all UN agencies, funds, and programmes; and

Whereas since 2000 UNGIWG has been able to facilitate inter-agency co-operation and co-ordination on specific issues in the fields of cartography and geographic information science and promote the use of geographic information within the United Nations System; and

Reaffirming that at its 7th Plenary Meeting, UNGIWG endorsed a strategic vision for a United Nations Spatial Data Infrastructure (UNSDI) as a comprehensive, decentralized geospatial information framework that facilitates decision-making at various levels by enabling access, retrieval and dissemination of geospatial data and information in a rapid and secure way;

Data portals and links

Data portals

FAO GeoNetwork

<http://www.fao.org/geonetwork>

Global Administrative Unit Layers (GAUL)

<http://www.fao.org/geonetwork/srv/en/metadata.show?id=12691>

Geographical Names

<http://unstats.un.org/unsd/geoinfo>

International and administrative boundaries

<http://boundaries.ungiq.org>

International Charter "Space and Major Disasters"

<http://www.disasterscharter.org>

UNEP.net

<http://unep.net>

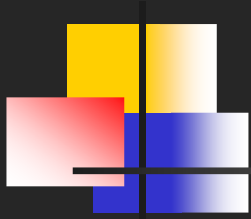
United Nations Entry Point to Geospatial Data Clearinghouse

<http://gateway.unqwg.org>

UNOSAT Remote Sensing Data Archive

<http://www.unosat.org/ungiq>

<http://www.unosat.org>



**Clearly,
Future of data situation is towards:**

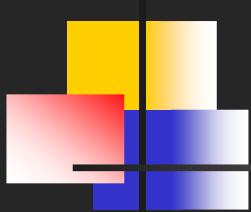
Availability

Open access

Viewable with SDIs and Web portals



Suggestions for Developments in Iran:



Formation of a Data Center similar to Swisstopo for collection, maintenance, and dissemination of national data

- Iran is in a position to take the lead and be a data center in the Middle East



مدلها در علوم

■ علم فيزيك

■ بر اساس اصول ثابت

■ علوم غير فيزيكي

■ مشكلات به خوبي مشخص نيستند

■ پروسه ها و مكانيسمها به خوبي مشخص نيستند

■ جمع آوري داده ها مشكل مي باشد



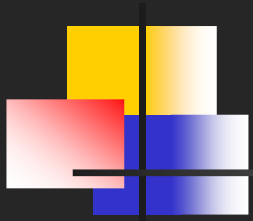
تعريف مدل

- هر نمايش و ارائه اي يا چكيده اي از يك سيستم و يا پروسه اي را مدل گویند.



مدلها چه كمكي به ما مي كنند؟

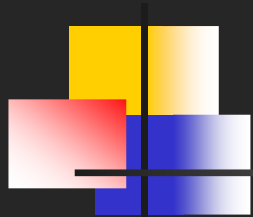
1. تعريف مشكلات
2. سازماندهي فكر
3. درك بهتر داده ها
4. ارتباط ما با ديگران از فهمان از سيستم
5. آسانتر آزمائش فهم ما از سيستم
6. پيش بيني سيستم



■ Modeling Concepts

■ Advantages

- Testing our knowledge of physical phenomena
- Integration of our knowledge into one framework
- Quantification of interesting variables
- Interpretation of data
- Ease of scenario analysis
- Creation of coherent projects
- Predictive capability

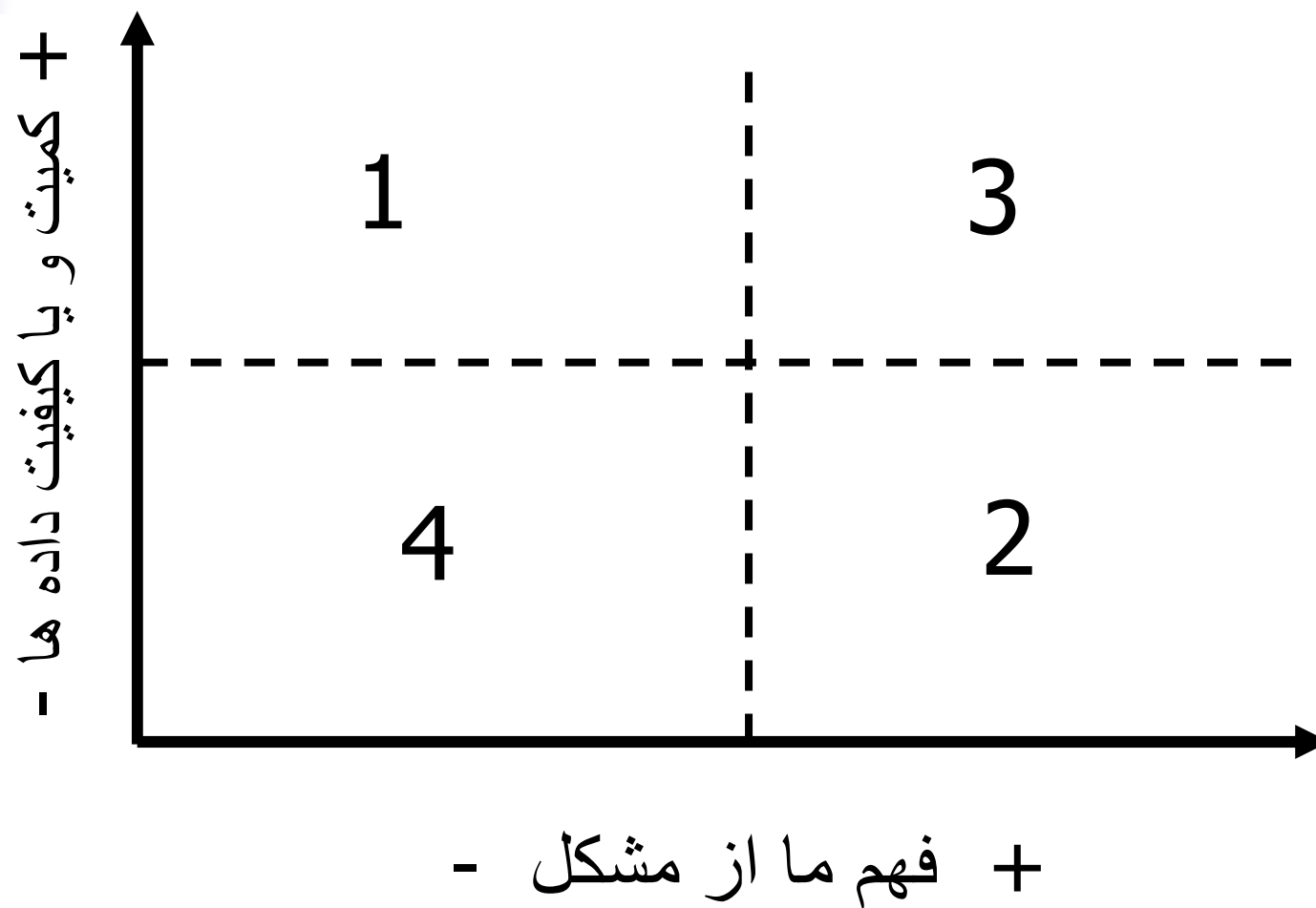


■ Modeling Concepts

■ Disadvantages

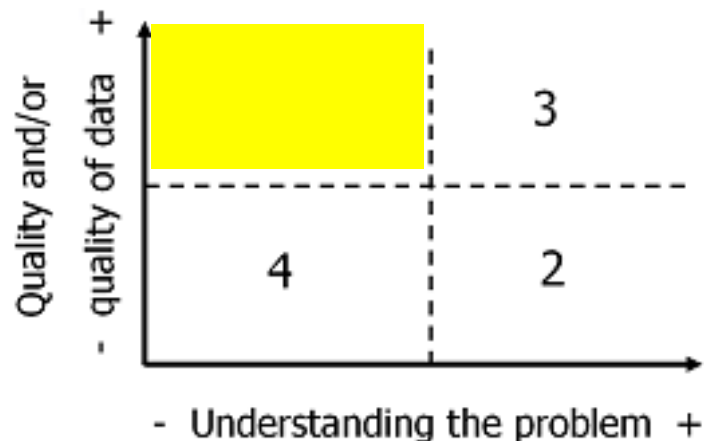
- Models are too inaccurate
- They are over parameterized
- Not possible to include all processes
- Not possible to measure all parameters
- Predictions are too uncertain to be used

طبقه بندی مدل سازی



ناحيه يك (داده هاي خوب و فهم كم)

- تكنيكهاي آماري مي توانند استفاده شوند تا:
- داده ها را تجزيه و تحليل کرده
- ارتباطها و الگوها مشخص شوند
- فرضيه هايي شكل گرفته و آزمايش شود.

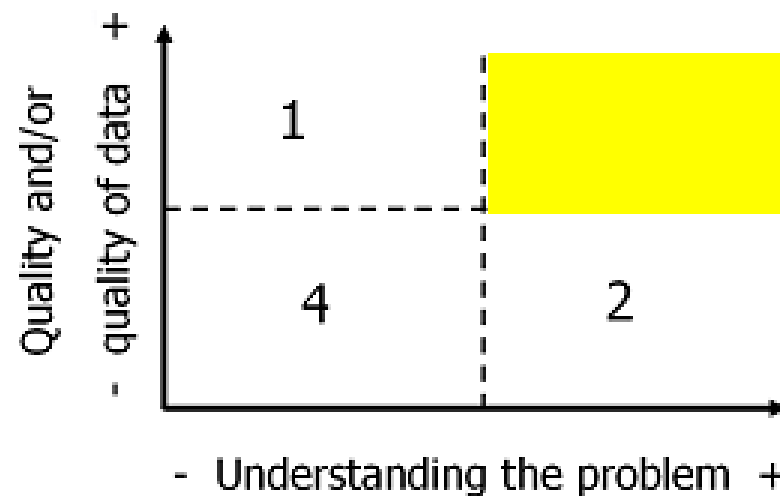


ناحیه سه (داده های خوب و فهم خوب)

■ علوم فیزیکی

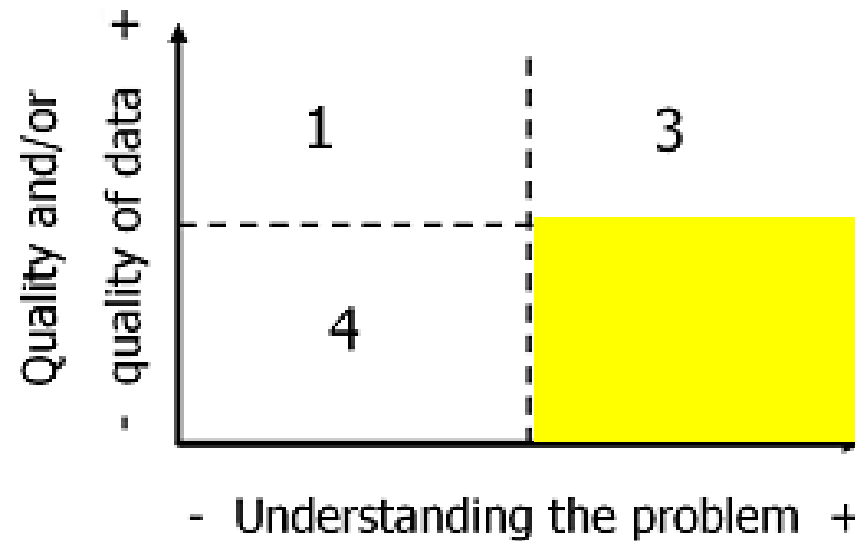
■ مدلها با اطمینان و به شکل عادی استفاده می شوند.

■ موثر بودن مدلها ثابت شده است.



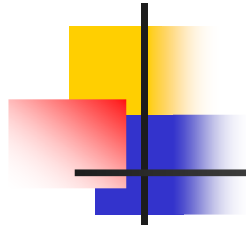
ناحيه دوم (داده هاي كم و فهم خوب)

■ علوم غير فيزيكي

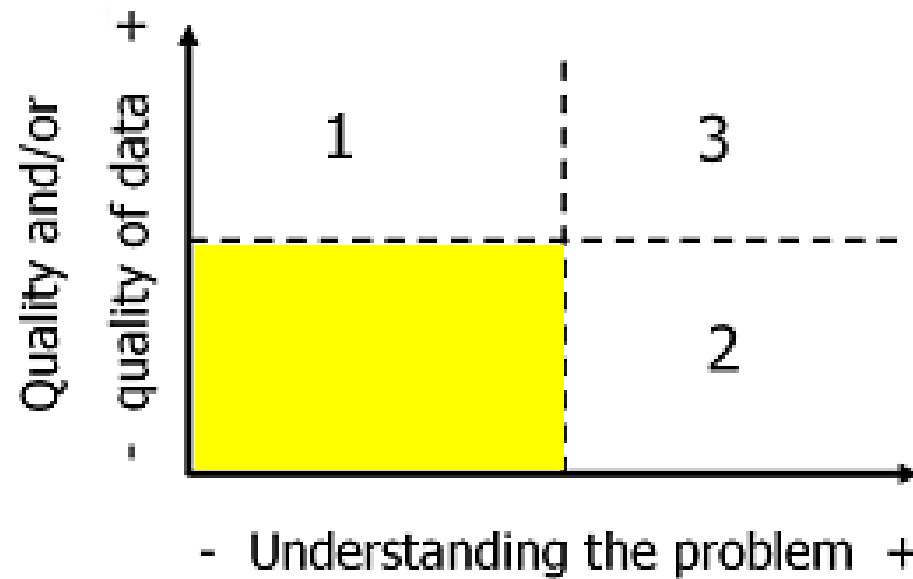


داده و فهم کم از سیستم

ناحیه چهارم



■ علوم غیر فیزیکی





سوال؟

- در مواقعي كه ما داده و اطلاعات خوبي از سيستم نداريم چگونه به تصميمات صحيح برسيم؟
- چطور ما ميزان فهمان از سيستم را بالا ببريم و داده هاي مورد نيازمان را بدست آوريم؟ (از ناحيه چهار به سه)



مدلها

- بایستی محتاطانه و با دقت مورد استفاده قرار گیرند
- جهت مکاشفه نتایجی که ما عقیده داریم که درست می باشد.



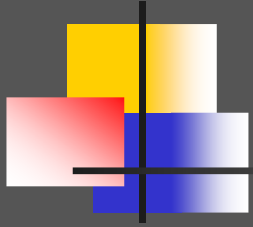
در نواحی 4 و 2 بایستی چه کنیم؟

- تمرین
- دست کاری
- زیر سوال بردن ارتباط
- مقایسه رفتار آنها با جهان واقعی
- ارزیابی مجدد از عقایدمان و رسیدن به نسخه جدیدی از مدل



احتياط

- آنهایی که داده جمع آوری می کنند بدون ساخت مدل در معرض خطر هستند!



Data → **Model**



Data gaps?