# Chance Discovery

*How to discover and suggest events causing potentially significant events?*

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# Chance Discovery

*Chance Discovery is the discovery* **of** *chance, rather than discovery* **by** *chance. A "chance" here means a new or rare event/situation that can be conceived either as an opportunity or as a risk.*

$$\neq$$

**Data Mining**

# History of Chance Discovry

*in conference or workshop*

KES2000

IEEE-IECON2000

JSAI2001 (CDWS1)

SCI2001

KES2001

$\Rightarrow\Rightarrow\Rightarrow$ PRICAI2002 (CDWS2)

KES2002

AAAI Fall symposium (2002)

HCI 2003?

XXXAI 2003??.....

## *journal*

New Generation Computings (Vol.21 No.1, No.2)
Special issues on Chance Discovery

## *books*

Chance Discovery (Springer): preparing..

*How to discover and suggest events causing potentially significant events?*

- Feature of Chance (Cognitive viewpoints...)

  6 papers

- Theoretical Foundation of/for Chance Discovery

  3 papers

- Application of Chance Discovery

  5 papers

## Feature of Chance (Cognitive viewpoints...)

- implicit memory $\leftarrow$ aware $\leftarrow$ analogical chance

  structure mapping (Gentner)

- conviction $\leftarrow$ visualization

  2D or 3D figure with structure helps

$$\textit{Chance has a structure?}$$

$$\textit{Chance is in a structure?}$$

## Theoretical Foundation of/for Chance Discovery

- (Manipulative) Abduction
- Dynamic Probabilistic Programing
- Belief-Desire-Intention Agent Theory

$$needs\ dynamism$$

$$incoherent \rightarrow be\ aware\ of\ chance$$

## Application of Chance Discovery

- Opportunity seize

  Finding or prediction of future boom etc.

  "Text mining" from Web page, Online-community, Newspaper etc.

- Risk hedge

  Intrusion detection

  Bank faulure prediction

*extraction of significant things*

*extraction of abnormal things*

*extraction of reliable things*

# Further discussions

- Do we need time aspect?

  Yes!! How? $\rightarrow$ dynamic logic? HMM?

- How to realize/suggest "chance" is significant?

  by/with uncertainty? probability? incoherence?

- Model $\Longleftarrow\!\!\Longrightarrow$ model free?

$$\text{Logical} \quad \Longleftarrow \quad \textit{with model} \quad \Longrightarrow \quad \begin{array}{c} \text{GA??} \\ \text{DPL??} \\ \text{HMM??} \\ \text{SVM??} \\ \text{SelfOrg??} \end{array}$$

- interaction between human beings and computers

  effective suggestion of chance