

## ΕΡΓΑΣΙΕΣ ΦΟΙΤΗΤΩΝ 2012 – ΑΝΑΛΥΣΗ ΑΠΟΦΑΣΕΩΝ & ΜΗΧΑΝΙΚΗ ΓΝΩΣΕΩΝ

Κάθε φοιτητής αναλαμβάνει μια ατομική εργασία, διαβάζει για αυτήν από όποιες πηγές του διαδικτύου κατορθώσει να βρει και παραδίδει ένα τρισέλιδο κείμενο με τα κυριότερα σημεία της έρευνάς του για το θέμα, ενώ ετοιμάζει και 3-4 διαφάνειες δεκάλεπτης παρουσίασης που θα γίνει την Παρασκευή 11 Ιανουαρίου 2013. Αναλόγως της ποιότητας της εργασίας θα δοθεί στον τελικό βαθμό του φοιτητή μισή ή μια προσθετική μονάδα.

Τόσο το κείμενο όσο και η παρουσίαση θα πρέπει να περιλαμβάνει συνοπτικά τη βασική ιδέα που ενσωματώνει η νοήμων μέθοδος (μαθηματικοποιημένα αλλά και σχηματικά), τα βασικά της χαρακτηριστικά, την χρησιμότητά της και τον τύπο προβλημάτων που αντιμετωπίζει επιτυχώς και αν είναι δυνατόν και ένα μικρό ενδεικτικό παράδειγμα. Τέλος θα πρέπει να περιλαμβάνεται και η βιβλιογραφία που χρησιμοποιήθηκε.

Υποβολή υλικού ηλεκτρονικά (κείμενο και διαφάνειες) πριν την παρουσίαση.

### ΘΕΜΑΤΑ

Bayesian Classifiers	Support Vector Machines
Recursive High Order Neural Networks	Fuzzy Rule Based Systems
Neuro-fuzzy systems	Neuro-genetic systems
Genetic-fuzzy systems	Memetic Algorithms
Artificial Immune Systems	Ant Colony Optimization
Particle Swarm Optimization	Bee Colony Optimization
Robocup Strategies	Temporal Reasoning
Intelligent Agents	K-nearest Neighbor Algorithm
Never-Ending Language Learning System	Pattern Recognition
Artificial Life	Intelligent Control

Έχουν δοθεί ήδη και ορισμένα εξειδικευμένα θέματα νοημόνων μεθοδολογιών με εφαρμογές τους σε Ανανεώσιμες Πηγές Ενέργειας.

Τέλος μπορεί κάποιος να μελετήσει κάποιο συγκεκριμένο bias από τη βιβλιογραφία στο διαδίκτυο και να παρουσιάσει τον τρόπο που αυτό επιδρά στη διαδικασία λήψης αποφάσεων.

- [Ambiguity effect](#) – the tendency to avoid options for which missing information makes the probability seem "unknown."<sup>[8]</sup>
- [Anchoring](#) – the tendency to rely too heavily, or "anchor," on a past reference or on one trait or piece of information when making decisions (also called "insufficient adjustment").
- [Attentional bias](#) – the tendency of emotionally dominant stimuli in one's environment to preferentially draw and hold attention and to neglect relevant data when making judgments of a correlation or association.
- [Availability heuristic](#) – the tendency to overestimate the likelihood of events with greater "availability" in memory, which can be influenced by how recent the memories are, or how unusual or emotionally charged they may be.
- [Availability cascade](#) – a self-reinforcing process in which a collective belief gains more and more plausibility through its increasing repetition in public discourse (or "repeat something long enough and it will become true").
- [Backfire effect](#) – when people react to disconfirming evidence by strengthening their beliefs.<sup>[9]</sup>

- **Bandwagon effect** – the tendency to do (or believe) things because many other people do (or believe) the same. Related to [groupthink](#) and [herd behavior](#).
- **Base rate fallacy** or **base rate neglect** – the tendency to base judgments on specifics, ignoring general statistical information.<sup>[10]</sup>
- **Belief bias** – an effect where someone's evaluation of the logical strength of an argument is biased by the believability of the conclusion.<sup>[11]</sup>
- **Bias blind spot** – the tendency to see oneself as less biased than other people, or to be able to identify more cognitive biases in others than in oneself.<sup>[12]</sup>
- **Choice-supportive bias** – the tendency to remember one's choices as better than they actually were.<sup>[13]</sup>
- **Clustering illusion** – the tendency to under-expect runs, streaks or clusters in small samples of random data
- **Confirmation bias** – the tendency to search for or interpret information in a way that confirms one's preconceptions.<sup>[14]</sup>
- **Congruence bias** – the tendency to test hypotheses exclusively through direct testing, in contrast to tests of possible alternative hypotheses.
- **Conjunction fallacy** – the tendency to assume that specific conditions are more probable than general ones.<sup>[15]</sup>
- **Conservatism** or **regressive bias** – tendency to underestimate high values and high likelihoods/probabilities/frequencies and overestimate low ones. Based on the observed evidence, estimates are not extreme enough<sup>[16][17][18]</sup>
- **Conservatism (Bayesian)** – the tendency to [belief update](#) insufficiently but predictably as a result of new evidence (estimates of conditional probabilities are conservative)<sup>[16][19][20]</sup>
- **Contrast effect** – the enhancement or diminishing of a weight or other measurement when compared with a recently observed contrasting object.<sup>[21]</sup>
- **Curse of knowledge** – when knowledge of a topic diminishes one's ability to think about it from a less-informed perspective.
- **Decoy effect** – preferences change when there is a third option that is asymmetrically dominated
- **Denomination effect** – the tendency to spend more money when it is denominated in small amounts (e.g. coins) rather than large amounts (e.g. bills).<sup>[22]</sup>
- **Distinction bias** – the tendency to view two options as more dissimilar when evaluating them simultaneously than when evaluating them separately.<sup>[23]</sup>
- **Duration neglect** – the neglect of the duration of an episode in determining its value
- **Empathy gap** – the tendency to underestimate the influence or strength of feelings, in either oneself or others.
- **Endowment effect** – the fact that people often demand much more to give up an object than they would be willing to pay to acquire it.<sup>[24]</sup>
- **Essentialism** – categorizing people and things according to their essential nature, in spite of variations.<sup>[25]</sup>
- **Exaggerated expectation** – based on the estimates, real-world evidence turns out to be less extreme than our expectations (conditionally inverse of the conservatism bias).<sup>[16][26]</sup>
- **Experimenter's or expectation bias** – the tendency for experimenters to believe, certify, and publish data that agree with their expectations for the outcome of an experiment, and to disbelieve, discard, or downgrade the corresponding weightings for data that appear to conflict with those expectations.<sup>[27]</sup>
- **False-consensus effect** - the tendency of a person to overestimate how much other people agree with him or her.
- **Functional fixedness** - limits a person to using an object only in the way it is traditionally used
- **Focalism** - the tendency to rely too heavily, or "anchor," on a past reference or on one trait or piece of information when making decisions.
- **Focusing effect** – the tendency to place too much importance on one aspect of an event; causes error in accurately predicting the utility of a future outcome.<sup>[28]</sup>
- **Forer effect** or **Barnum effect** – the observation that individuals will give high accuracy ratings to descriptions of their personality that supposedly are tailored specifically for them, but are in fact vague and general enough to apply to a wide range of people. This effect can provide a partial explanation for the widespread acceptance of some beliefs and practices, such as astrology, fortune telling, graphology, and some types of personality tests.
- **Framing effect** – drawing different conclusions from the same information, depending on how or by whom that information is presented.

- **Frequency illusion** – the illusion in which a word, a name or other thing that has recently come to one's attention suddenly appears "everywhere" with improbable frequency (see also [recency illusion](#)).<sup>[29]</sup>
- **Gambler's fallacy** – the tendency to think that future probabilities are altered by past events, when in reality they are unchanged. Results from an erroneous conceptualization of the [law of large numbers](#). For example, "I've flipped heads with this coin five times consecutively, so the chance of tails coming out on the sixth flip is much greater than heads."
- **Hard-easy effect** – Based on a specific level of task difficulty, the confidence in judgments is too conservative and not extreme enough<sup>[16][30][31][32]</sup>
- **Hindsight bias** – sometimes called the "I-knew-it-all-along" effect, the tendency to see past events as being predictable<sup>[33]</sup> at the time those events happened. Colloquially referred to as "Hindsight is 20/20".
- **Hostile media effect** – the tendency to see a media report as being biased due to one's own strong partisan views.
- **Hyperbolic discounting** – the tendency for people to have a stronger preference for more immediate payoffs relative to later payoffs, where the tendency increases the closer to the present both payoffs are.<sup>[34]</sup>
- **Illusion of control** – the tendency to overestimate one's degree of influence over other external events.<sup>[35]</sup>
- **Illusion of validity** – when consistent but predictively weak data leads to confident predictions
- **Illusory correlation** – inaccurately perceiving a relationship between two unrelated events.<sup>[36][37]</sup>
- **Impact bias** – the tendency to overestimate the length or the intensity of the impact of future feeling states.<sup>[38]</sup>
- **Information bias** – the tendency to seek information even when it cannot affect action.<sup>[39]</sup>
- **Insensitivity to sample size** – the tendency to under-expect variation in small samples
- **Irrational escalation** – the phenomenon where people justify increased investment in a decision, based on the cumulative prior investment, despite new evidence suggesting that the decision was probably wrong.
- **Just-world hypothesis** – the tendency for people to want to believe that the world is fundamentally just, causing them to rationalize an otherwise inexplicable injustice as deserved by the victim(s).
- **Less-is-better effect** – a preference reversal where a dominated smaller set is preferred to a larger set
- **Loss aversion** – "the disutility of giving up an object is greater than the utility associated with acquiring it".<sup>[40]</sup> (see also [Sunk cost effects](#) and endowment effect).
- **Ludic fallacy** - the misuse of games to model real-life situations.
- **Mere exposure effect** – the tendency to express undue liking for things merely because of familiarity with them.<sup>[41]</sup>
- **Money illusion** – the tendency to concentrate on the nominal (face value) of money rather than its value in terms of purchasing power.<sup>[42]</sup>
- **Moral credential effect** – the tendency of a track record of non-prejudice to increase subsequent prejudice.
- **Negativity bias** – the tendency to pay more attention and give more weight to negative than positive experiences or other kinds of information.
- **Neglect of probability** – the tendency to completely disregard probability when making a decision under uncertainty.<sup>[43]</sup>
- **Normalcy bias** – the refusal to plan for, or react to, a disaster which has never happened before.
- **Observer-expectancy effect** – when a researcher expects a given result and therefore unconsciously manipulates an experiment or misinterprets data in order to find it (see also [subject-expectancy effect](#)).
- **Omission bias** – the tendency to judge harmful actions as worse, or less moral, than equally harmful omissions (inactions).<sup>[44]</sup>
- **Optimism bias** – the tendency to be over-optimistic, overestimating favorable and pleasing outcomes (see also [wishful thinking](#), [valence effect](#), [positive outcome bias](#)).<sup>[45][46]</sup>

- **Ostrich effect** – ignoring an obvious (negative) situation.
- **Outcome bias** – the tendency to judge a decision by its eventual outcome instead of based on the quality of the decision at the time it was made.
- **Overconfidence effect** – excessive confidence in one's own answers to questions. For example, for certain types of questions, answers that people rate as "99% certain" turn out to be wrong 40% of the time. <sup>[16][47][48][49]</sup>
- **Pareidolia** – a vague and random stimulus (often an image or sound) is perceived as significant, e.g., seeing images of animals or faces in clouds, the **man in the moon**, and hearing non-existent **hidden messages** on **records played in reverse**.
- **Pessimism bias** – the tendency for some people, especially those suffering from **depression**, to overestimate the likelihood of negative things happening to them.
- **Planning fallacy** – the tendency to underestimate task-completion times. <sup>[38]</sup>
- **Post-purchase rationalization** – the tendency to persuade oneself through rational argument that a purchase was a good value.
- **Pro-innovation bias** – the tendency to reflect a personal bias towards an invention/innovation, while often failing to identify limitations and weaknesses or address the possibility of failure.
- **Pseudocertainty effect** – the tendency to make risk-averse choices if the expected outcome is positive, but make risk-seeking choices to avoid negative outcomes. <sup>[50]</sup>
- **Reactance** – the urge to do the opposite of what someone wants you to do out of a need to resist a perceived attempt to constrain your freedom of choice (see also **Reverse psychology**).
- **Reactive devaluation** – devaluing proposals that are no longer hypothetical or purportedly originated with an adversary.
- **Recency bias** – a cognitive bias that results from disproportionate salience attributed to recent stimuli or observations – the tendency to weigh recent events more than earlier events (see also **peak-end rule**, **recency effect**).
- **Recency illusion** – the illusion that a phenomenon, typically a word or language usage, that one has just begun to notice is a recent innovation (see also frequency illusion).
- **Restraint bias** – the tendency to overestimate one's ability to show restraint in the face of temptation.
- **Rhyme as reason effect** – rhyming statements are perceived as more truthful. A famous example being used in the O.J Simpson trial with the defenses use of the phrase "If the gloves don't fit then you must acquit."
- **Selective perception** – the tendency for expectations to affect perception.
- **Semmelweis reflex** – the tendency to reject new evidence that contradicts a paradigm. <sup>[51]</sup>
- **Selection bias** - the distortion of a statistical analysis, resulting from the method of collecting samples. If the selection bias is not taken into account then certain conclusions drawn may be wrong.
- **Social comparison bias** – the tendency, when making hiring decisions, to favour potential candidates who don't compete with one's own particular strengths. <sup>[52]</sup>
- **Social desirability bias** - the tendency to over-report socially desirable characteristics or behaviours and under-report socially undesirable characteristics or behaviours. <sup>[53]</sup>
- **Status quo bias** – the tendency to like things to stay relatively the same (see also loss aversion, endowment effect, and system justification). <sup>[54][55]</sup>
- **Stereotyping** – expecting a member of a group to have certain characteristics without having actual information about that individual.
- **Subadditivity effect** – the tendency to estimate that the likelihood of an event is less than the sum of its (more than two) mutually exclusive components. <sup>[56]</sup>

- **Subjective validation** – perception that something is true if a subject's belief demands it to be true. Also assigns perceived connections between coincidences.
- **Survivorship bias** - concentrating on the people or things that "survived" some process and inadvertently overlooking those that didn't because of their lack of visibility.
- **Texas sharpshooter fallacy** - pieces of information that have no relationship to one another are called out for their similarities, and that similarity is used for claiming the existence of a pattern.
- **Time-saving bias** – underestimations of the time that could be saved (or lost) when increasing (or decreasing) from a relatively low speed and overestimations of the time that could be saved (or lost) when increasing (or decreasing) from a relatively high speed.
- **Unit bias** – the tendency to want to finish a given unit of a task or an item. Strong effects on the consumption of food in particular.<sup>[57]</sup>
- **Well travelled road effect** – underestimation of the duration taken to traverse oft-traveled routes and overestimation of the duration taken to traverse less familiar routes.
- **Zero-risk bias** – preference for reducing a small risk to zero over a greater reduction in a larger risk.
- **Zero-sum heuristic** – Intuitively judging a situation to be zero-sum (i.e., that gains and losses are correlated). Derives from the zero-sum game in [game theory](#), where wins and losses sum to zero.<sup>[58][59]</sup> The frequency with which this bias occurs may be related to the [social dominance orientation](#) personality factor.