

Non-determinism in now-adays computing and IT education

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Abstract – Once-upon-a time computers and computations they delivered were considered ultimately deterministic; most of IT specialty students have heard the remark of Claude Shannon, ‘the father of the field’ who claimed that anyone who considers creating randomness with computer is “living in a state of sin”. But currently we encounter non-determinism in many areas of computation theory and practice: non-determinism introduced by network latency, inherently non-deterministic computations with ‘big data’ and ‘deep learning’ where the results are probability distributions with errors, which also are probability distributions and both depend on initial selection of samples etc. For IT education one of the most disturbing sources of non-determinism and non-repeatability of previous examples comes from tremendous speed of IT technology development. This has nearly eliminated significance of classical source of knowledge: printed hard-cover books – by the time the books are out of print there are already new versions of programs, new

protocols, new technologies and libraries, and these new versions often do not work with old ones. Thus the most relevant source of information has become Internet. But ‘Internet never forgets’ – together with sources describing latest program versions, libraries, technologies etc. there are still around tens of publications which use some by now already outdated program versions, libraries, technologies. Students, who are eager to perform well in the next recruiting interview (but also IT teachers who want to produce well-informed classes) are spending many evenings trying to clear this non-deterministic mess, where most of presented examples are not repeatable. And the situation is becoming worse, since many of authors e.g. YouTube videos do not want to teach, but to earn using Google AdSense.

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