

1 Python Conventions

1. PEP 8
2. PEP 257 for docstrings
3. Google-Styleguide for Python
4. Auto-Documentation with Sphinx (uses markdown for layout)

2 IDTxl Units

- SI units for user input/output
- internally, everything is handled in samples, i.e., user input should be translated into samples asap
- in general, arrays denote any non-scalar variable

3 IDTxl Variable and Function Names

Measures

ent	entropy
cent	conditional entropy
mi	mutual information
cmi	conditional mutual information
multi	multiinformation
lais	local active information storage
ais	active information storage
lte	local transfer entropy
te	transfer entropy
mi_syn	synergistic information
mi_unq	unique information
mi_shd	shared information

Variable Types

variable	random variable
process	most generic name for a series of realisation (e.g. realisations over time, i.e., a time series)
sample	individual realisation of a variable, i.e., one entry in a data array
source(__set)	ordered series of realisations of some variable (e.g. a time series) that is investigated as source of information for a second, <i>target</i> variable (e.g. in TE estimation); may be a set of vectors

target	ordered series of realisations of some variable (e.g. a time series) that is investigated as target variable in TE estimation or other directed measures
current_value	present sample to be predicted by past states/values (e.g. in AIS or TE estimation)
past/history	past values with respect to the current value/present of a time series (e.g. in TE or AIS estimation for time series)
conditional	variable to be conditioned on (e.g. in CMI estimation)

Function Names

$\langle \text{measure} \rangle_calculator_ \langle \text{type} \rangle$	estimator that takes raw variables or embedded variables as input
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Estimator Types

kraskov	Kraskov estimator
kl	Kozachenko-Leonenko estimator
gaussian	Gaussian estimator
kernel	Gaussian estimator

Data Properties

continuous	variable that takes continuous values
discrete	variable that takes discrete values
alphabet_size	number of symbols in a variable
replication	repetition of a recording, e.g., trial in neuro-experiment

Algorithm

$idx_ \langle \text{variable} \rangle (_ \langle \text{set} \rangle)$	index of a single sample or set of indices
$candidate(_ \text{set})$	potential sample or set of samples for (non-)uniform embedding
max_lag	maximum lag for samples entering the candidate set
min_lag	minimum lag for samples entering the candidate set
embedding_dimension	dimension of the embedding, i.e., n.o. samples taken from a variables past to reconstruct a variable's current state
embedding_delay	delay of the embedding, i.e., the step size in n.o. samples between two past samples to reconstruct a variable's current state
theiler_k	n.o. samples to be excluded in neighbour searches, Theiler correction
kraskov_k	n.o. nearest neighbours for the Kraskov estimator
lag_{max}	max. past sample used as a candidate
lag_{min}	min. past sample used as a candidate
source_target_delay	input delay in samples, i.e., something that is passed to an estimator

interaction_delay	output of the estimation (e.g. reconstructed delay in TE estimation)
surrogate_{variable}	surrogate data set for a variable