**ma**chine **le**arning **term**inology

**di**vided **i**nto **cate**gories. **I** **h**ave **gr**ouped **t**he **te**rms **ba**sed **o**n **th**eir **rel**evance **a**nd **simi**larity. **I** **h**ope **y**ou **f**ind **t**his **l**ist **us**eful **a**nd **info**rmative.

**Ma**chine **Le**arning **Ba**sics

**Ma**chine **lea**rning: **A** **br**anch **o**f **art**ificial **inte**lligence **t**hat **en**ables **sy**stems **t**o **le**arn **f**rom **d**ata **a**nd **im**prove **th**eir **perf**ormance **wi**thout **ex**plicit **prog**ramming.

**Da**ta: **T**he **r**aw **info**rmation **o**r **fa**cts **t**hat **a**re **u**sed **a**s **in**put **o**r **ou**tput **f**or **ma**chine **le**arning **algo**rithms.

**La**bel: **T**he **va**lue **o**r **ca**tegory **t**hat **w**e **w**ant **t**o **pr**edict **o**r **ex**plain **us**ing **ma**chine **le**arning **mo**dels.

**Fe**ature: **A**n **att**ribute **o**r **char**acteristic **o**f **t**he **d**ata **t**hat **i**s **u**sed **a**s **in**put **f**or **ma**chine **le**arning **mo**dels.

**Mo**del: **A** **math**ematical **repr**esentation **o**f **t**he **rela**tionship **be**tween **t**he **fe**atures **a**nd **t**he **la**bel, **o**r **be**tween **t**he **fe**atures **them**selves.

**Tra**ining: **T**he **pr**ocess **o**f **adj**usting **t**he **par**ameters **o**f **a** **mo**del **t**o **f**it **t**he **d**ata **a**nd **mi**nimize **t**he **er**ror.

**Inf**erence: **T**he **pr**ocess **o**f **us**ing **a** **tr**ained **mo**del **t**o **m**ake **pred**ictions **o**r **dec**isions **ba**sed **o**n **n**ew **o**r **un**seen **da**ta.

**Eval**uation: **T**he **pr**ocess **o**f **mea**suring **t**he **perf**ormance **a**nd **ac**curacy **o**f **a** **mo**del **us**ing **me**trics **a**nd **te**sts.

**Vali**dation: **T**he **pr**ocess **o**f **ch**ecking **wh**ether **a** **mo**del **me**ets **t**he **requ**irements **a**nd **expe**ctations **o**f **t**he **pr**oblem **do**main **a**nd **t**he **stak**eholders.

**Depl**oyment: **T**he **pr**ocess **o**f **ma**king **a** **mo**del **ava**ilable **f**or **u**se **i**n **a** **pro**duction **envi**ronment **o**r **a** **rea**l-world **sce**nario.

**Ma**chine **Le**arning **Ty**pes

**Sup**ervised **lea**rning: **A** **t**ype **o**f **ma**chine **le**arning **t**hat **u**ses **la**beled **d**ata **(d**ata **w**ith **kn**own **an**swers) **t**o **tr**ain **alg**orithms **t**o **cl**assify **d**ata **o**r **pr**edict **out**comes.

**Unsu**pervised **lea**rning: **A** **t**ype **o**f **ma**chine **le**arning **t**hat **u**ses **unl**abeled **d**ata **(d**ata **wi**thout **kn**own **an**swers) **t**o **di**scover **pat**terns, **stru**ctures, **o**r **hi**dden **info**rmation **i**n **t**he **da**ta.

**Semi**-supervised **lea**rning: **A** **t**ype **o**f **ma**chine **le**arning **t**hat **u**ses **a** **comb**ination **o**f **la**beled **a**nd **unl**abeled **d**ata **t**o **tr**ain **alg**orithms **t**hat **c**an **be**nefit **f**rom **b**oth **ty**pes **o**f **da**ta.

**Rein**forcement **lea**rning: **A** **t**ype **o**f **ma**chine **le**arning **t**hat **u**ses **fe**edback **f**rom **t**he **envi**ronment **t**o **tr**ain **alg**orithms **t**o **le**arn **op**timal **ac**tions **o**r **po**licies **f**or **a** **gi**ven **sit**uation.

**Self**-supervised **lea**rning: **A** **t**ype **o**f **ma**chine **le**arning **t**hat **u**ses **self**-generated **la**bels **o**r **obj**ectives **t**o **tr**ain **alg**orithms **t**o **le**arn **f**rom **unl**abeled **da**ta.

**Ma**chine **Le**arning **Ta**sks

**Clas**sification: **A** **ma**chine **le**arning **t**ask **t**hat **in**volves **ass**igning **a** **la**bel **o**r **ca**tegory **t**o **a**n **in**put **ba**sed **o**n **pre**defined **cl**asses **o**r **cri**teria.

**Regr**ession: **A** **ma**chine **le**arning **t**ask **t**hat **in**volves **pre**dicting **a** **con**tinuous **va**lue **o**r **ou**tcome **f**or **a**n **in**put **ba**sed **o**n **num**erical **fe**atures **o**r **var**iables.

**Clus**tering: **A** **ma**chine **le**arning **t**ask **t**hat **in**volves **gr**ouping **si**milar **in**puts **i**nto **cl**usters **o**r **se**gments **ba**sed **o**n **th**eir **fe**atures **o**r **char**acteristics.

**Dime**nsionality **red**uction: **A** **ma**chine **le**arning **t**ask **t**hat **in**volves **re**ducing **t**he **nu**mber **o**f **fe**atures **o**r **var**iables **i**n **t**he **d**ata **b**y **pre**serving **t**he **m**ost **re**levant **o**r **imp**ortant **info**rmation.

**An**omaly **det**ection: **A** **ma**chine **le**arning **t**ask **t**hat **in**volves **iden**tifying **ab**normal **o**r **un**usual **in**puts **t**hat **de**viate **f**rom **t**he **no**rmal **o**r **ex**pected **pa**ttern **i**n **t**he **da**ta.

**Asso**ciation **r**ule **mi**ning: **A** **ma**chine **le**arning **t**ask **t**hat **in**volves **fi**nding **ru**les **o**r **pa**tterns **t**hat **de**scribe **h**ow **dif**ferent **it**ems **o**r **var**iables **a**re **re**lated **o**r **co**-occur **i**n **t**he **da**ta.

**Reco**mmendation **sy**stem: **A** **ma**chine **le**arning **t**ask **t**hat **in**volves **sug**gesting **it**ems **o**r **pr**oducts **t**hat **a**re **li**kely **t**o **b**e **o**f **in**terest **o**r **pre**ference **t**o **a** **u**ser **ba**sed **o**n **th**eir **p**ast **be**havior **o**r **pr**ofile.

**Ma**chine **Le**arning **Alg**orithms

**Li**near **regr**ession: **A** **sup**ervised **le**arning **alg**orithm **t**hat **mo**dels **t**he **rela**tionship **be**tween **o**ne **o**r **m**ore **fe**atures **a**nd **a** **con**tinuous **la**bel **us**ing **a** **li**near **fun**ction.

**Lo**gistic **regr**ession: **A** **sup**ervised **le**arning **alg**orithm **t**hat **mo**dels **t**he **prob**ability **o**f **a**n **in**put **bel**onging **t**o **a** **bi**nary **cl**ass **us**ing **a** **lo**gistic **fun**ction.

**De**cision **tr**ee: **A** **sup**ervised **le**arning **alg**orithm **t**hat **bu**ilds **a** **tre**e-like **str**ucture **wh**ere **e**ach **n**ode **rep**resents **a** **fe**ature, **e**ach **br**anch **rep**resents **a** **dec**ision, **a**nd **e**ach **l**eaf **rep**resents **a** **la**bel.

**Ex**plore

**H**ere **a**re **s**ome **m**ore **term**inologies **re**lated **t**o **ma**chine **le**arning **t**hat **y**ou **mi**ght **f**ind **us**eful:

**Bi**as: **T**he **dif**ference **be**tween **t**he **ex**pected **va**lue **a**nd **t**he **t**rue **va**lue **o**f **a** **ta**rget **var**iable. **B**ias **c**an **a**lso **re**fer **t**o **t**he **te**ndency **o**f **a** **mo**del **t**o **le**arn **inc**orrect **pa**tterns **o**r **assu**mptions **f**rom **t**he **da**ta.

**Var**iance: **T**he **vari**ability **o**r **sp**read **o**f **t**he **pre**dicted **va**lues **ar**ound **t**he **ex**pected **va**lue. **Va**riance **c**an **a**lso **re**fer **t**o **t**he **sens**itivity **o**f **a** **mo**del **t**o **sm**all **ch**anges **o**r **no**ise **i**n **t**he **da**ta.

**Unde**rfitting: **A** **pr**oblem **t**hat **oc**curs **w**hen **a** **mo**del **i**s **t**oo **si**mple **o**r **h**as **t**oo **f**ew **par**ameters **t**o **ca**pture **t**he **com**plexity **o**r **vari**ability **o**f **t**he **da**ta. **Unde**rfitting **re**sults **i**n **h**igh **b**ias **a**nd **l**ow **var**iance, **a**nd **p**oor **perf**ormance **o**n **b**oth **tr**aining **a**nd **t**est **da**ta.

**Over**fitting: **A** **pr**oblem **t**hat **oc**curs **w**hen **a** **mo**del **i**s **t**oo **co**mplex **o**r **h**as **t**oo **m**any **par**ameters **t**o **f**it **t**he **d**ata **t**oo **we**ll. **Over**fitting **re**sults **i**n **l**ow **b**ias **a**nd **h**igh **var**iance, **a**nd **p**oor **gene**ralization **t**o **n**ew **o**r **un**seen **da**ta.

**Regu**larization: **A** **tec**hnique **t**hat **c**an **h**elp **t**o **pr**event **over**fitting **b**y **ad**ding **a** **pe**nalty **t**erm **t**o **t**he **c**ost **fu**nction **t**hat **de**pends **o**n **t**he **va**lues **o**r **com**plexity **o**f **t**he **mo**del **para**meters. **Regu**larization **c**an **h**elp **t**o **re**duce **t**he **va**riance **a**nd **no**ise **o**f **t**he **mo**del **b**y **shr**inking **o**r **pr**uning **t**he **para**meters.

**Cros**s-validation: **A** **tec**hnique **t**hat **c**an **h**elp **t**o **ev**aluate **a**nd **co**mpare **t**he **perf**ormance **o**f **dif**ferent **mo**dels **o**r **hype**rparameters **b**y **spl**itting **t**he **d**ata **i**nto **mu**ltiple **su**bsets **a**nd **us**ing **s**ome **su**bsets **f**or **tr**aining **a**nd **s**ome **su**bsets **f**or **te**sting. **Cros**s-validation **c**an **h**elp **t**o **re**duce **t**he **over**fitting **a**nd **b**ias **o**f **t**he **mo**del **b**y **us**ing **dif**ferent **comb**inations **o**f **d**ata **f**or **tr**aining **a**nd **te**sting.

**Hype**rparameter: **A** **par**ameter **t**hat **co**ntrols **t**he **be**havior **o**r **conf**iguration **o**f **a** **ma**chine **le**arning **alg**orithm, **s**uch **a**s **t**he **le**arning **ra**te, **t**he **nu**mber **o**f **iter**ations, **o**r **t**he **nu**mber **o**f **hi**dden **la**yers. **Hype**rparameters **a**re **n**ot **le**arned **f**rom **t**he **da**ta, **b**ut **a**re **s**et **be**fore **tra**ining.

**Opti**mization: **T**he **pr**ocess **o**f **fi**nding **t**he **op**timal **va**lues **o**r **se**ttings **f**or **t**he **mo**del **par**ameters **o**r **hype**rparameters **t**hat **mi**nimize **t**he **c**ost **fu**nction **o**r **ma**ximize **t**he **perf**ormance **me**tric. **Opti**mization **c**an **in**volve **dif**ferent **me**thods **o**r **algo**rithms, **s**uch **a**s **gr**adient **de**scent, **sto**chastic **gr**adient **de**scent, **o**r **ge**netic **algo**rithms.

**Gr**adient **de**scent: **A**n **opti**mization **alg**orithm **t**hat **iter**atively **up**dates **t**he **mo**del **par**ameters **b**y **mo**ving **i**n **t**he **op**posite **dir**ection **o**f **t**he **gr**adient **(**or **sl**ope) **o**f **t**he **c**ost **fu**nction **w**ith **re**spect **t**o **t**he **para**meters. **Gr**adient **de**scent **c**an **h**elp **t**o **f**ind **t**he **lo**cal **mi**nimum **o**r **gl**obal **mi**nimum **o**f **t**he **c**ost **fun**ction, **dep**ending **o**n **t**he **in**itial **va**lues **o**r **se**ttings **o**f **t**he **para**meters.

**Sto**chastic **gr**adient **de**scent: **A** **va**riant **o**f **gr**adient **de**scent **t**hat **up**dates **t**he **mo**del **par**ameters **b**y **us**ing **o**nly **a** **si**ngle **o**r **a** **sm**all **ba**tch **o**f **ra**ndomly **se**lected **ex**amples **a**t **e**ach **ite**ration. **Sto**chastic **gr**adient **de**scent **c**an **h**elp **t**o **sp**eed **u**p **t**he **conv**ergence **a**nd **av**oid **lo**cal **mi**nima **b**y **intr**oducing **ran**domness **a**nd **no**ise **i**n **t**he **gr**adient **calc**ulation.

**I**f **y**ou **w**ant **t**o **le**arn **m**ore **ab**out **th**ese **term**inologies, **y**ou **c**an **ch**eck **o**ut **th**ese **w**eb **se**arch **re**sults: **,** **,** **.**