Machine learning and statistics for a predictive maintenance concept

29-May-2017

NTNU Ålesund

Project manager	MG
Project dates	12-Jan-2017 - 06-Jun-2017
Completion	100%
Tasks	55
Resources	4

Tasks

Resources	Name	Begin date	End date	Coordinator	Completion	Duration
MG, KS, EF, RBV	A1 Pre-project report	12/01/17	17/01/17	KS	100	4
	A2 Specification of the concept	13/01/17	20/01/17		100	6
MG, KS	A2.1 Definition	13/01/17	20/01/17	MG	100	6
EF, RBV	A2.2 Tools and software	13/01/17	20/01/17	EF	100	6
KS	First actions in Azure	16/01/17	16/01/17	KS	100	0
MG, KS, EF, RBV	Every member can make easy predictive Azure models	19/01/17	19/01/17	KS	100	0
	A3 Literature search and research work	12/01/17	03/02/17		100	17
MG, KS, EF, RBV	A3.1 ML/Predictive analysis	12/01/17	03/02/17	MG	100	17
MG, KS, EF, RBV	A3.2 MS Azure	12/01/17	03/02/17	KS	100	17
MG, KS, EF, RBV	A3.3 Preprocessing	12/01/17	03/02/17	RBV	100	17
KS, RBV	A4 Tools (SQL, Wonderware etc.)	26/01/17	06/02/17	KS	100	8
	A5 Data processing	30/01/17	03/03/17		100	25
EF, RBV	A5.1 Python Exploration	30/01/17	03/02/17	EF	100	5
MG, RBV	A5.2 Import of data	01/02/17	09/02/17	MG	100	7
MG, EF	A5.3 Selection for simulator data	06/02/17	10/02/17	MG	100	5
KS, EF	A5.4 Rules for missing data	10/02/17	13/02/17	EF	100	2
	First data pre-processing setup is ready	20/02/17	20/02/17		100	0
EF, RBV	A5.5 Transformation	03/02/17	17/02/17	RBV	100	11
KS, RBV	A5.6 Feature extraction	03/02/17	22/02/17	KS	100	14
RBV	A5.8 Create Python pre-processing library for Azure	13/02/17	28/02/17	RBV	100	12
MG, RBV	A5.7 Analyse data processing	23/02/17	03/03/17	MG	100	7

Tasks

Resources	Name	Begin date	End date	Coordinator	Completion	Duration
	First predictive model made with Intelecy data	27/02/17	27/02/17		100	0
MG	A6 Visualization with Python and Azure	13/02/17	28/02/17	MG	100	12
MG, KS	A6.1 Explore Python plots possibilities	13/02/17	17/02/17	MG	100	5
MG	A6.2 Make Python script "How to plot"	17/02/17	22/02/17	MG	100	4
MG, RBV	A6.3 Make Python visualization library for Azure	22/02/17	28/02/17	MG	100	5
	A7 Explore and test Machine learning in Azure	15/02/17	03/03/17		100	13
MG, EF	A7.1 Time Series Anomaly Detection	15/02/17	28/02/17	EF	100	10
MG, RBV	A7.2 Regression models *Regression comparison models*	21/02/17	03/03/17	RBV	100	9
KS, RBV	A7.3 PCA-based Anomaly Detection	27/02/17	03/03/17	RBV	100	5
KS, RBV	A7.4 One-class SVm	27/02/17	03/03/17	KS	100	5
	First test of predictive system	06/03/17	06/03/17		100	0
MG, KS, EF, RBV	Break due to Industry 4.0 Lectures	06/03/17	20/03/17	MG	100	11
	A8 Predictive maintenance - Event Prediction	06/03/17	05/05/17		100	45
MG, EF	A8.1 RUL Prediction NASA	06/03/17	11/04/17	MG	100	27
MG, EF	A8.2 RUL Prediction Battery Dataset	10/04/17	28/04/17	MG	100	15
MG, EF	A8.3 RUL with classification NASA	20/04/17	05/05/17	EF	100	12
MG, EF	A8.4 Predict time until end of charge	01/05/17	05/05/17	MG	100	5

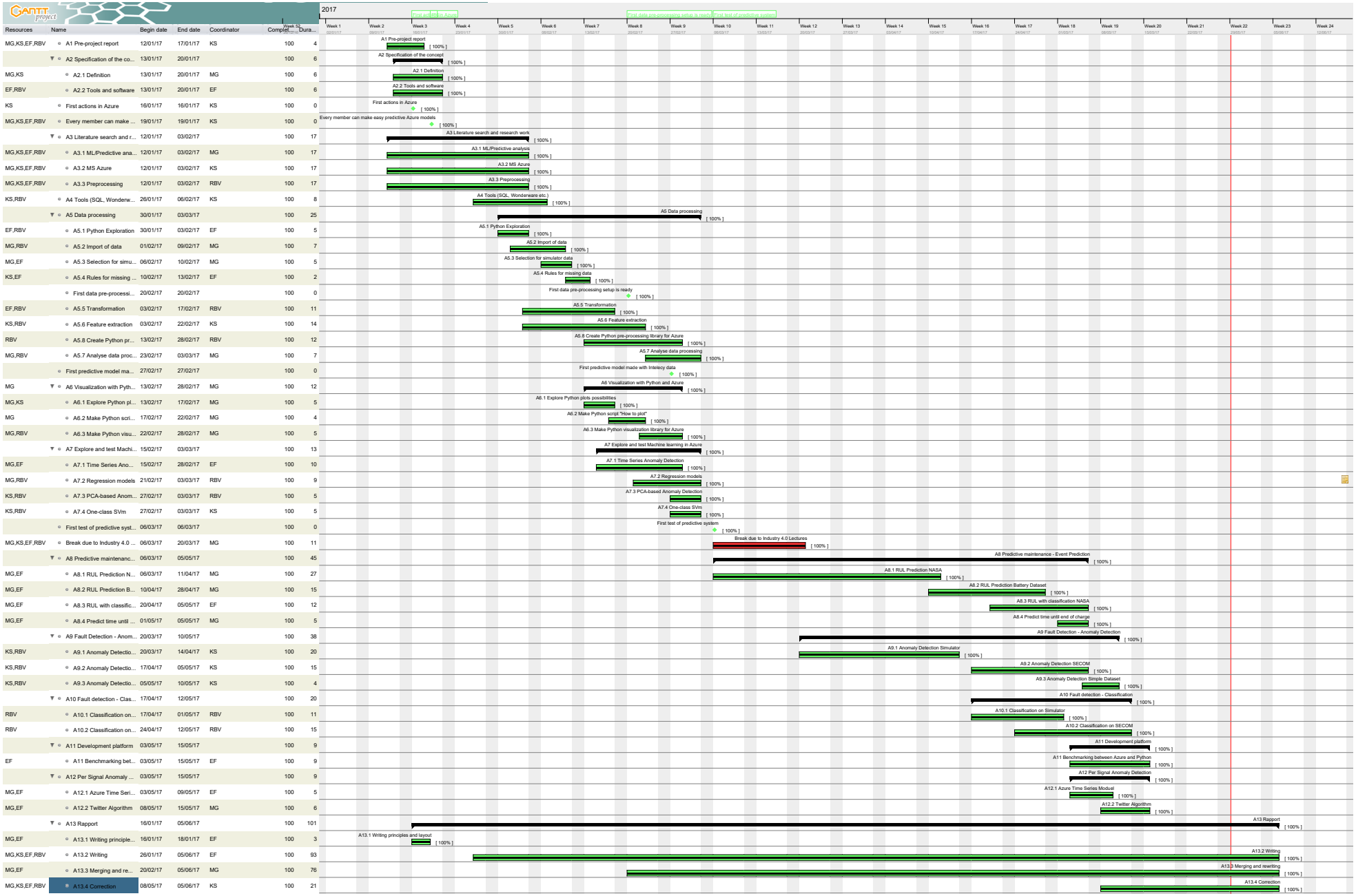
Tasks

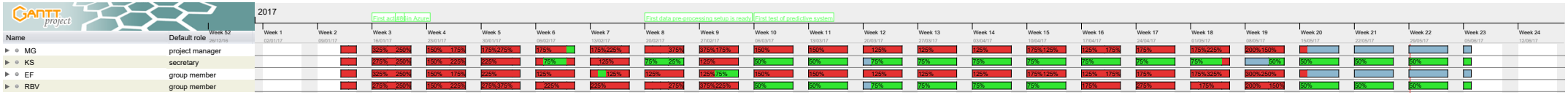
Resources	Name	Begin date	End date	Coordinator	Completion	Duration
	A9 Fault Detection - Anomaly Detection	20/03/17	10/05/17		100	38
KS, RBV	A9.1 Anomaly Detection Simulator	20/03/17	14/04/17	KS	100	20
KS, RBV	A9.2 Anomaly Detection SECOM	17/04/17	05/05/17	KS	100	15
KS, RBV	A9.3 Anomaly Detection Simple Dataset	05/05/17	10/05/17	KS	100	4
	A10 Fault detection - Classification	17/04/17	12/05/17		100	20
RBV	A10.1 Classification on Simulator	17/04/17	01/05/17	RBV	100	11
RBV	A10.2 Classification on SECOM	24/04/17	12/05/17	RBV	100	15
	A11 Development platform	03/05/17	15/05/17		100	9
EF	A11 Benchmarking between Azure and Python	03/05/17	15/05/17	EF	100	9
	A12 Per Signal Anomaly Detection	03/05/17	15/05/17		100	9
MG, EF	A12.1 Azure Time Series Moduel	03/05/17	09/05/17	EF	100	5
MG, EF	A12.2 Twitter Algorithm	08/05/17	15/05/17	MG	100	6
	A13 Rapport	16/01/17	05/06/17		100	101
MG, EF	A13.1 Writing principles and layout	16/01/17	18/01/17	EF	100	3
MG, KS, EF, RBV	A13.2 Writing	26/01/17	05/06/17	EF	100	93
MG, EF	A13.3 Merging and rewriting	20/02/17	05/06/17	MG	100	76
MG, KS, EF, RBV	A13.4 Correction	08/05/17	05/06/17	KS	100	21

Resources

Name	Default role
MG	project manager
KS	secretary
EF	group member
RBV	group member

Gantt Chart



Resources	Name	Begin date	End date	Coordinator	Complet...	Dura...
MG,KS,EF,RBV	A1 Pre-project report	12/01/17	17/01/17	KS	100	4
	A2 Specification of the co...	13/01/17	20/01/17		100	6
MG,KS	A2.1 Definition	13/01/17	20/01/17	MG	100	6
EF,RBV	A2.2 Tools and software	13/01/17	20/01/17	EF	100	6
KS	First actions in Azure	16/01/17	16/01/17	KS	100	0
MG,KS,EF,RBV	Every member can make ...	19/01/17	19/01/17	KS	100	0
	A3 Literature search and r...	12/01/17	03/02/17		100	17
MG,KS,EF,RBV	A3.1 ML/Predictive ana...	12/01/17	03/02/17	MG	100	17
MG,KS,EF,RBV	A3.2 MS Azure	12/01/17	03/02/17	KS	100	17
MG,KS,EF,RBV	A3.3 Preprocessing	12/01/17	03/02/17	RBV	100	17
KS,RBV	A4 Tools (SQL, Wonderw...	26/01/17	06/02/17	KS	100	8
	A5 Data processing	30/01/17	03/03/17		100	25
EF,RBV	A5.1 Python Exploration	30/01/17	03/02/17	EF	100	5
MG,RBV	A5.2 Import of data	01/02/17	09/02/17	MG	100	7
MG,EF	A5.3 Selection for simu...	06/02/17	10/02/17	MG	100	5
KS,EF	A5.4 Rules for missing ...	10/02/17	13/02/17	EF	100	2
	First data pre-processi...	20/02/17	20/02/17		100	0
EF,RBV	A5.5 Transformation	03/02/17	17/02/17	RBV	100	11
KS,RBV	A5.6 Feature extraction	03/02/17	22/02/17	KS	100	14
RBV	A5.8 Create Python pr...	13/02/17	28/02/17	RBV	100	12
MG,RBV	A5.7 Analyse data proc...	23/02/17	03/03/17	MG	100	7
	First predictive model ma...	27/02/17	27/02/17		100	0
MG	A6 Visualization with Pyth...	13/02/17	28/02/17	MG	100	12
MG,KS	A6.1 Explore Python pl...	13/02/17	17/02/17	MG	100	5
MG	A6.2 Make Python scri...	17/02/17	22/02/17	MG	100	4
MG,RBV	A6.3 Make Python visu...	22/02/17	28/02/17	MG	100	5
	A7 Explore and test Machi...	15/02/17	03/03/17		100	13
MG,EF	A7.1 Time Series Ano...	15/02/17	28/02/17	EF	100	10
MG,RBV	A7.2 Regression models	21/02/17	03/03/17	RBV	100	9
KS,RBV	A7.3 PCA-based Anom...	27/02/17	03/03/17	RBV	100	5
KS,RBV	A7.4 One-class SVm	27/02/17	03/03/17	KS	100	5
	First test of predictive syst...	06/03/17	06/03/17		100	0
MG,KS,EF,RBV	Break due to Industry 4.0 ...	06/03/17	20/03/17	MG	100	11
	A8 Predictive maintenanc...	06/03/17	05/05/17		100	45
MG,EF	A8.1 RUL Prediction N...	06/03/17	11/04/17	MG	100	27
MG,EF	A8.2 RUL Prediction B...	10/04/17	28/04/17	MG	100	15
MG,EF	A8.3 RUL with classific...	20/04/17	05/05/17	EF	100	12
MG,EF	A8.4 Predict time until ...	01/05/17	05/05/17	MG	100	5
	A9 Fault Detection - Anom...	20/03/17	10/05/17		100	38
KS,RBV	A9.1 Anomaly Detectio...	20/03/17	14/04/17	KS	100	20
KS,RBV	A9.2 Anomaly Detectio...	17/04/17	05/05/17	KS	100	15
KS,RBV	A9.3 Anomaly Detectio...	05/05/17	10/05/17	KS	100	4
	A10 Fault detection - Clas...	17/04/17	12/05/17		100	20
RBV	A10.1 Classification on...	17/04/17	01/05/17	RBV	100	11
RBV	A10.2 Classification on...	24/04/17	12/05/17	RBV	100	15
	A11 Development platform	03/05/17	15/05/17		100	9
EF	A11 Benchmarking bet...	03/05/17	15/05/17	EF	100	9
	A12 Per Signal Anomaly ...	03/05/17	15/05/17		100	9
MG,EF	A12.1 Azure Time Seri...	03/05/17	09/05/17	EF	100	5
MG,EF	A12.2 Twitter Algorithm	08/05/17	15/05/17	MG	100	6
	A13 Rapport	16/01/17	05/06/17		100	101
MG,EF	A13.1 Writing principle...	16/01/17	18/01/17	EF	100	3
MG,KS,EF,RBV	A13.2 Writing	26/01/17	05/06/17	EF	100	93
MG,EF	A13.3 Merging and re...	20/02/17	05/06/17	MG	100	76
MG,KS,EF,RBV	A13.4 Correction	08/05/17	05/06/17	KS	100	21

Resources Chart