List of Acronyms

1G First Generation

2G Second Generation

3G Third Generation

3GPP 3rd Generation Partnership Project

4G Fourth Generation

ADC Analog-to-Digital Converter

AM Acknowledged Mode

AMC Adaptive Modulation and Coding

ANN Artificial Neural Network

ARQ Automatic Repeat Request

ART Adaptive Resonance Theory

ASIC Application Specific Integrated Circuits

AWGN Additive White Gaussian Noise

BB Baseband Processing Unit

BER Bit Error Rate

BLER Block Error Rate

BPA Back-Propagation Algorithm

CAE Computer Aided Engineering

CCS Code Composer Studio

CDF Cumulative Distribution Function

CDMA Code Division Multiple Access

CLSM Close-Loop Spatial Multiplexing

CP Cyclic Prefix

CPLD Complex Programmable Logic Device

CQI Channel Quality Indicator

CRS Cell-specific Reference Signal

CSI Channel State Information

DAC Digital-to-Analog Converter

DCI Downlink Control Information

DDR Double Data Rate

DMA Diversity, Multiplexing and Array gain

DM-RS Demodulation Reference Signals

DMT Diversity and Multiplexing tradeoff

DSK DSP Starter kit

DSP Digital Signal Processor

EC Evolutionary Computation

EDA Electronic Design Automation

EDGE Enhanced Data for Global Evolution

EE Energy Efficiency

EMIF External Memory Interface

eNB Evolved Base Stations-eNodeB

EPC Evolved Packet Core

E-UTRA Evolved- Universal Terrestrial Radio Access

E-UTRAN Evolved-UMTS Terrestrial Radio Access Network

FDD Frequency Division Duplexing

FIS Fuzzy Inference System

FIL FPGA-in-the-loop

FL Fuzzy Logic

FLC Fuzzy Logic Controller

FNN Feed-forward Neural Network

FPGA Field Programmable Gate Arrays

FTE Faculty of Technology and Engineering

GA Genetic Algorithms

GPP General Purpose Processors

GPRS General Packet Radio Service

GRNN General Regression Neural Network

GSM Global System for Mobile Communications

GUI Graphical User Interface

HARQ Hybrid Automatic Repeat Request

HDL Hardware Description Language

HDMI High-Definition Multimedia Interface

HSDPA High Speed Downlink Packet Access

HSPA High Speed Packet Access

HSUPA High Speed Uplink Packet Access

i.i.d Independent Identically Distributed

I2C Inter-Integrated Circuit

IDE Integrated Development Environment

IMT- Advanced International Mobile Telecommunications-Advanced

IMT-2000 International Mobile Telecommunications-2000

IR Infrared

ISE Integrated Software Environment

ITU International Telecommunications Union

JTAG Joint Test Action Group

LCD Liquid Crystal Display

LED Light Emitting Diode

LOS Line-Of-Sight

LRN Layered Recurrent Network

LS Least Square

LTE Long Term Evolution

LTE-A Long Term Evolution-Advanced

MAC Medium Access Control

MATLAB Matrix Laboratory

MBMS Multimedia Broadcast Multicast Services

MCS Modulation and Coding Scheme

MF Membership Function

MIMO Multiple-Input Multiple-Output

MISO Multi-Input Single-Output

MIMO-WS Multi-Input Multi-Output Wireless Simulator

ML Maximum Likelihood

MME Mobility Management Entity

MMS Multimedia Messaging Service

MMSE Minimum Mean Square Error

NAS Non-Access Stratum

OFDMA Orthogonal Frequency Division Multiplexing Access

OLSM Open-Loop Spatial Multiplexing

OSTBC Orthogonal Space-Time Block Code

PAR Place-and-route

PDP Power Delay Profile

PDSCH Physical Downlink Shared Channel

PIL Processor-in-the-Loop

PMI Precoder Matrix Indicator

PDCP Packet Data Convergence Protocol

PDF Probability Density Function

PDN Packet Data Network

P-GW Packet Data Network Gateway

PHY Physical Layer

PR Probabilistic Reasoning

PSTN Public Switched Telephone Network

QAM Quadrature Amplitude Modulation

QPSK Quadrature Phase Shift Keying

QoS Quality of Service

RACH Random Access Channel

RAM Random-Access Memory

RB Resource Blocks

RI Rank Indicator

RBF Radial Basis Function

RBNN Radial Basis Neural Network

RF Radio frequency

RLC Radio Link Control

RNN Recurrent Neural Network

ROHC Robust Header Compression

RP Rapid Prototyping

RRC Radio Resource Control

RS Reference Signal

RTW Real-Time Workshop

SC-FDMA Single-Carrier Frequency Division Multiple Access

SDRAM Synchronous Dynamic Random-Access Memory

SE Spectral Efficiency

S-GW Serving Gateway

SM Spatial Multiplexing

SOM Self-organizing Map

STC Space Time Coding

STTC Space-Time Trellis Code

SDU Service Data Unit

SIL Software-in-the-Loop

SIMO Single-Input Multi-Output

SISO Single-Input Single-Output

SMS Short Message Service

SNR Signal-to-Noise Ratio

TDD Time Division Duplexing

TI Texas Instruments

TM Transparent Mode

UE User Equipment

TRT Throughput-Reliability Tradeoff

UART Universal Asynchronous Receiver/Transmitter

UCI Uplink Control Information

UM Unacknowledged Mode

UMTS Universal Mobile Telecommunications System

UP User Plane

USB Universal Serial Bus

USRP Universal Software Radio Peripheral

UE User Equipment

V-BLAST Vertical Bell-Labs Layered Space-Time Architecture

VHDC Very-High-Density Cable

W-CDMA Wideband Code Division Multiple Access

WiFi Wireless Fidelity

WiMax Worldwide Interoperability for Microwave Access

Wimax2 Wireless MAN-advanced

WLAN Wireless Local Area Network

XUP Xilinx University Program

ZF Zero-Forcing