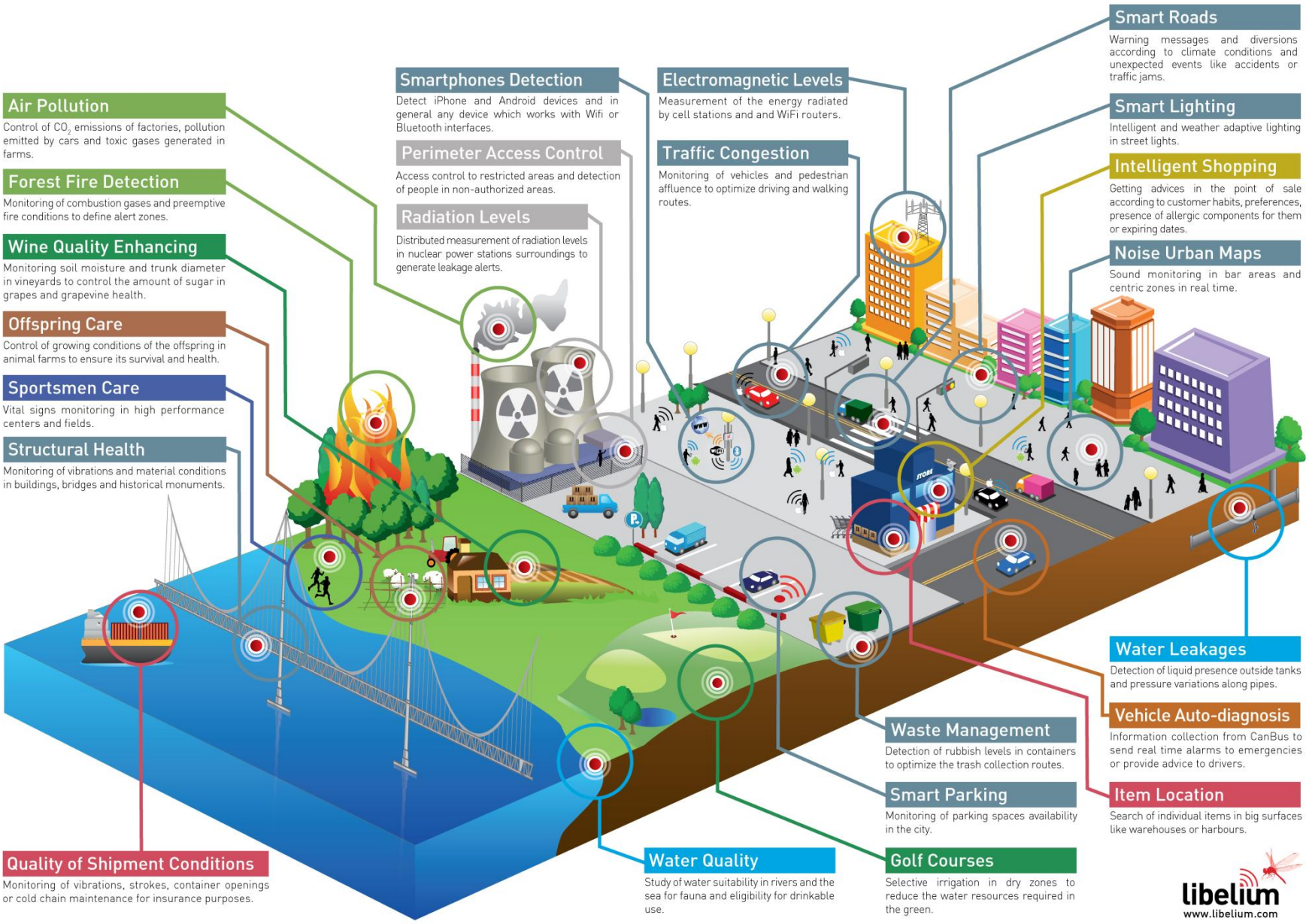
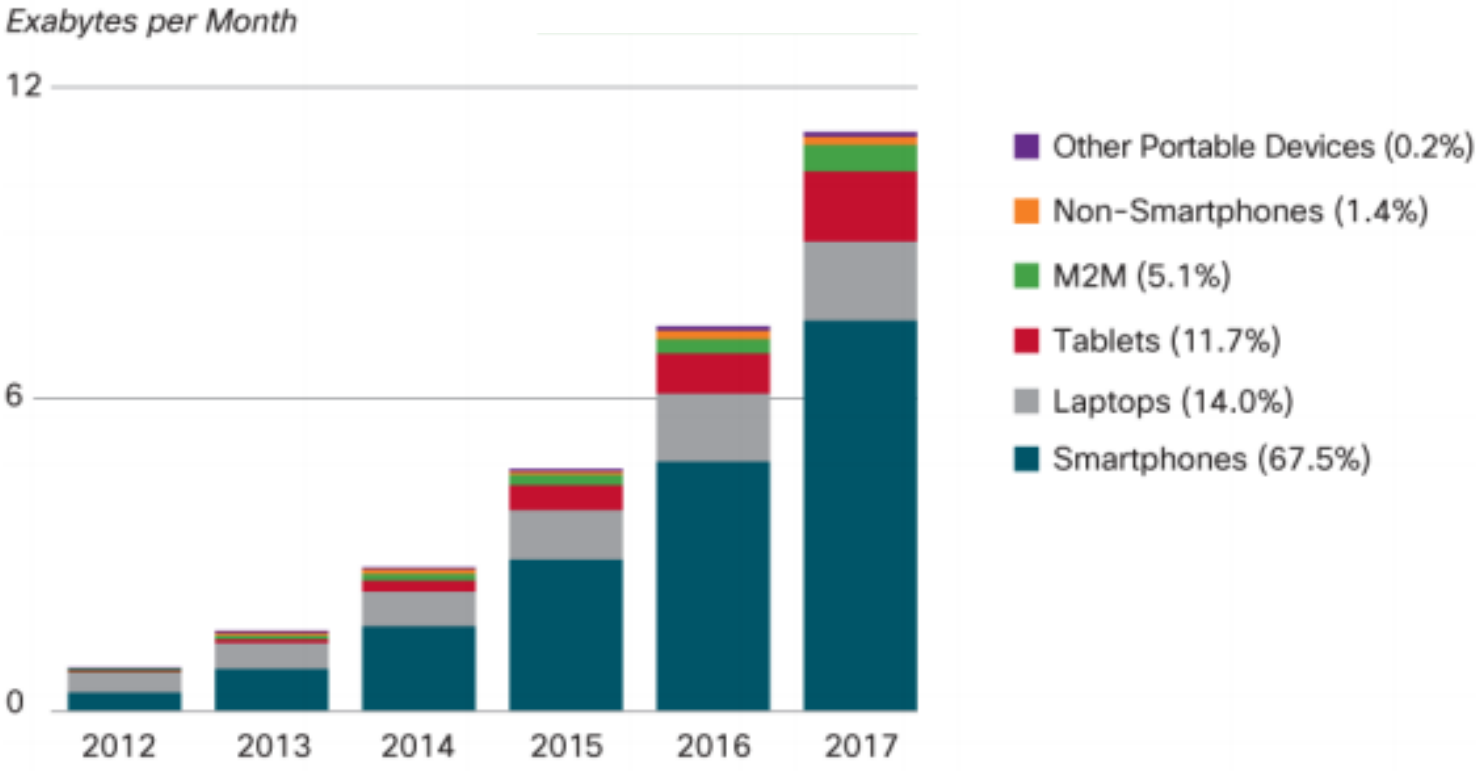
Blockseminar: The "Internet of Things" for industrial applications

Organization and Introduction


Air Pollution
Control of CO_2 emissions of factories, pollution emitted by cars and toxic gases generated in farms.
Forest Fire Detection
Monitoring of combustion gases and preemptive fire conditions to define alert zones.
Wine Quality Enhancing
Monitoring soil moisture and trunk diameter in vineyards to control the amount of sugar in grapes and grapevine health.
Offspring Care
Control of growing conditions of the offspring in animal farms to ensure its survival and health.
Sportsmen Care
Vital signs monitoring in high performance centers and fields.
Structural Health
Monitoring of vibrations and material conditions in buildings, bridges and historical monuments.
Quality of Shipment Conditions
Monitoring of vibrations, strokes, container openings or cold chain maintenance for insurance purposes.
Smartphones Detection
Detect iPhone and Android devices and in general any device which works with Wifi or Bluetooth interfaces.
Perimeter Access Control
Access control to restricted areas and detection of people in non-authorized areas.
Radiation Levels
Distributed measurement of radiation levels in nuclear power stations surroundings to generate leakage alerts.
Electromagnetic Levels
Measurement of the energy radiated by cell stations and and WiFi routers.
Traffic Congestion
Monitoring of vehicles and pedestrian affluence to optimize driving and walking routes.
Smart Roads
Warning messages and diversions according to climate conditions and unexpected events like accidents or traffic jams.
Smart Lighting
Intelligent and weather adaptive lighting in street lights.
Intelligent Shopping
Getting advices in the point of sale according to customer habits, preferences, presence of allergic components for them or expiring dates.
Noise Urban Maps
Sound monitoring in bar areas and centric zones in real time.
Water Leakages
Detection of liquid presence outside tanks and pressure variations along pipes.
Vehicle Auto-diagnosis
Information collection from CanBus to send real time alarms to emergencies or provide advice to drivers.
Item Location
Search of individual items in big surfaces like warehouses or harbours.
Waste Management
Detection of rubbish levels in containers to optimize the trash collection routes.
Smart Parking
Monitoring of parking spaces availability in the city.
Water Quality
Study of water suitability in rivers and the sea for fauna and eligibility for drinkable use.
Golf Courses
Selective irrigation in dry zones to reduce the water resources required in the green.
libelium
www.libelium.com

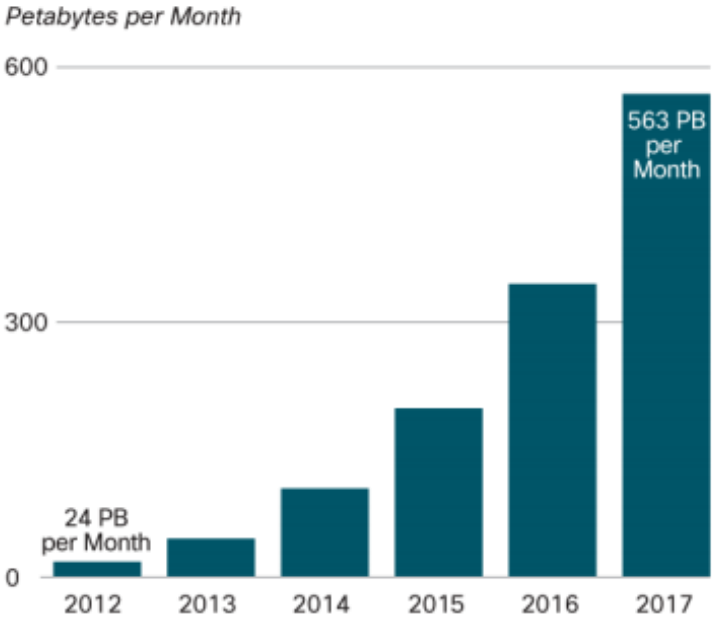
Cisco Mobile Traffic Forecast



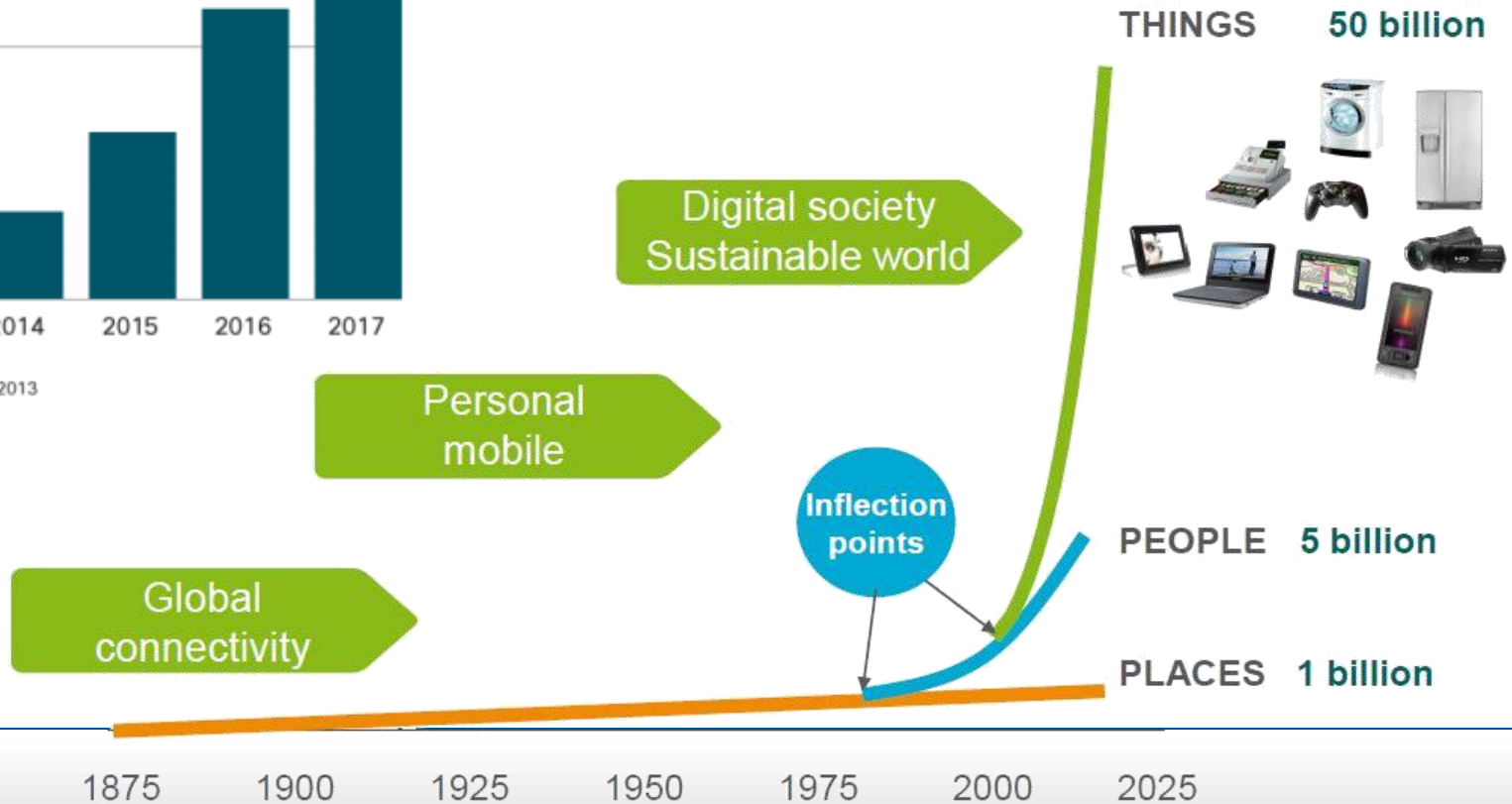
Figures in legend refer to traffic share in 2017.

Source: Cisco VNI Mobile Forecast, 2013

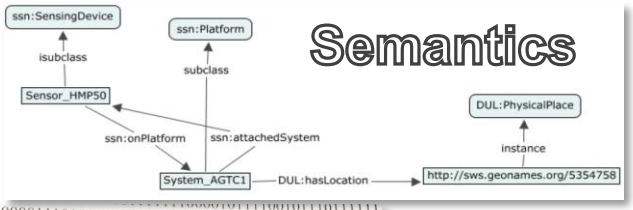
Cisco Mobile Traffic Forecast – M2M

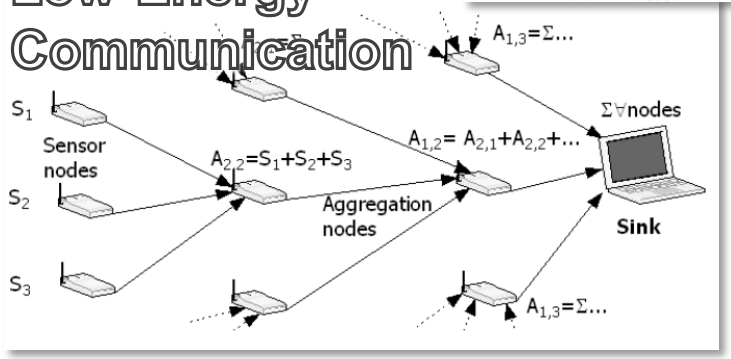


Source: Cisco VNI Mobile Forecast, 2013



IoT Technologies and industrial applications





Organization

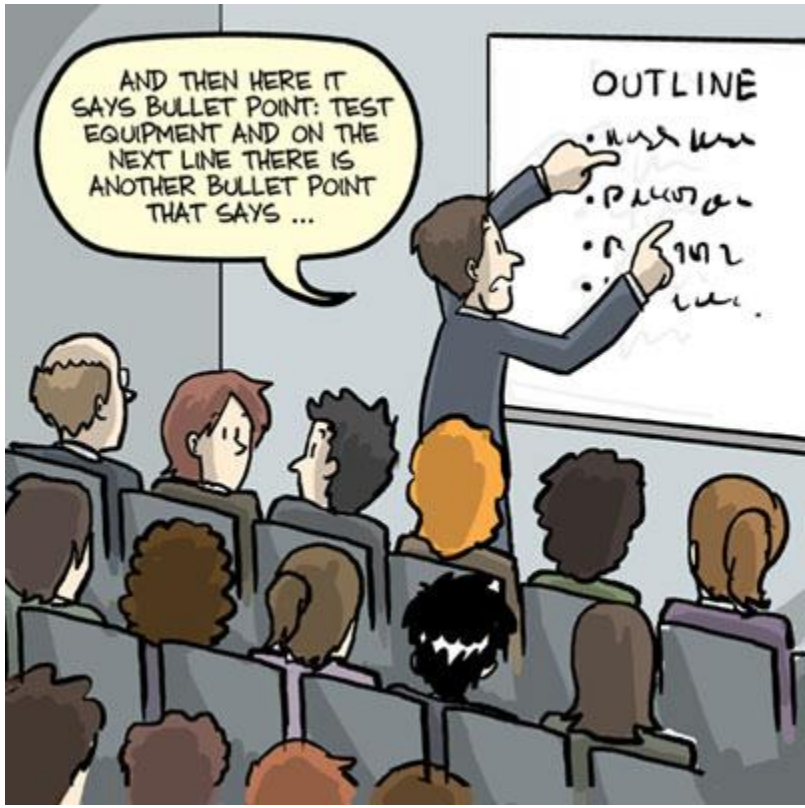
Requirements for Bachelors / Masters

- Attending the introductory session
- Attending the seminar days
- Holding a seminar talk (30 minutes, with plenary discussion)
  - The presentation counts towards 50% of your final grade
- Writing a 4 / 6 page seminar paper
  - The paper counts towards the other 50% of your grade
- Discussion with your advisor of: talk outline & slides, paper draft
  - Mandatory!
  - Keep the deadlines in mind (next slide)

Dates and Deadlines

Task / Event	Date
Introductory Session	Oct. 17th
Registration for topics by e-mail	Oct. 24th
Session on how to give a good seminar talk (optional)	Nov. 8th
Session on scientific paper writing (optional)	Dec. 13th
Discussion of talk outline with advisor	before Dec 7th
Discussion of slides with advisor	before Dec. 21st
2 Seminar days	between Jan. 7th – 17th
Discussion of paper draft with advisor	before Feb. 1st
Finished seminar paper	Feb. 7th

About the seminar talk

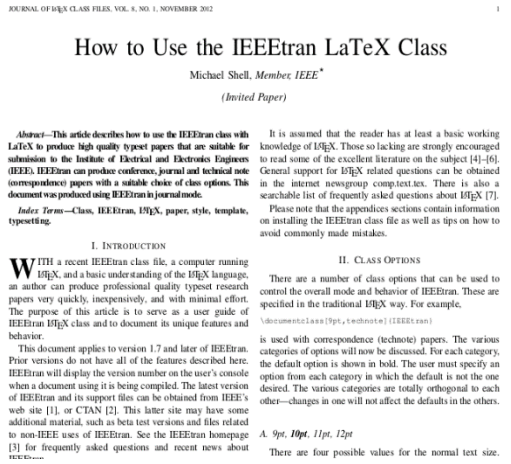


- 30 minutes, including discussion of your topic
  Language for the talk is English
- Keep it correct and informative but comprehensible
  - Getting everyone to understand is important
  - Don‘t turn your slides into collections of equations and figures
  - You can go into more detail in your seminar paper
- Style and visuals of the slides are up to you

→ Visit the optional session on giving a good seminar talk!

About the seminar paper

- Four pages for Bachelor students, six for Master students, in German or English
- In the style of a scientific publication
  - Factual, neutral and objective discussion of your topic
  - Scientific language and precise statements
  - Proper use of citations from credible sources
  - Conforming to a standard layout template from the scientific community (see seminar webpage)



JOURNAL OF LATEX CLASS FILES, VOL. 8, NO. 1, NOVEMBER 2012 1

How to Use the IEEEtran LaTeX Class

Michael Shell, *Member, IEEE**

(Invited Paper)

***Abstract*—This article describes how to use the IEEEtran class with LaTeX to produce high quality typeset papers that are suitable for submission to the Institute of Electrical and Electronics Engineers (IEEE). IEEEtran can produce conference, journal and technical note (correspondence) papers with a suitable choice of class options. This document was produced using IEEEtran in journal mode.**

***Index Terms*—Class, IEEEtran, LaTeX, paper, style, template, typesetting.**

I. Introduction

WITH a recent IEEEtran class file, a computer running LaTeX, and a basic understanding of the LaTeX language, an author can produce professional quality typeset research papers very quickly, inexpensively, and with minimal effort. The purpose of this article is to serve as a user guide of IEEEtran LaTeX class and to document its unique features and behavior.

This document applies to version 1.7 and later of IEEEtran. Prior versions do not have all of the features described here. IEEEtran will display the version number on the user's console when a document using it is being compiled. The latest version of IEEEtran and its support files can be obtained from IEEE's web site [1], or CTAN [2]. This latter site may have some additional material, such as beta test versions and files related to non-IEEE uses of IEEEtran. See the IEEEtran homepage [3] for frequently asked questions and recent news about

It is assumed that the reader has at least a basic working knowledge of LaTeX. Those so lacking are strongly encouraged to read some of the excellent literature on the subject [4]–[6]. General support for LaTeX related questions can be obtained in the internet newsgroup comp.text.tex. There is also a searchable list of frequently asked questions about LaTeX [7].

Please note that the appendices sections contain information on installing the IEEEtran class file as well as tips on how to avoid commonly made mistakes.

II. Class Options

There are a number of class options that can be used to control the overall mode and behavior of IEEEtran. These are specified in the traditional LaTeX way. For example,

```
\documentclass[9pt,technote]{IEEEtran}
```

is used with correspondence (technote) papers. The various categories of options will now be discussed. For each category, the default option is shown in bold. The user must specify an option from each category in which the default is not the one desired. The various categories are totally orthogonal to each other—changes in one will not affect the defaults in the others.

*A. 9pt, **10pt**, 11pt, 12pt*

There are four possible values for the normal text size.

→ Visit the optional session on scientific paper writing!

Next steps

- Choose a topic!
  - Topic areas will be introduced now
  - Choose at least two areas, write to topic advisor if you have questions about the topic area
  - E-mail your topic choices to seminar organizer (kothmayr@in.tum.de) before Oct. 24th
- Finding dates for the seminar days
  - You‘ll receive an e-mail with a voting link
  - Mark the dates when you‘re available
  - Don‘t cherry-pick!