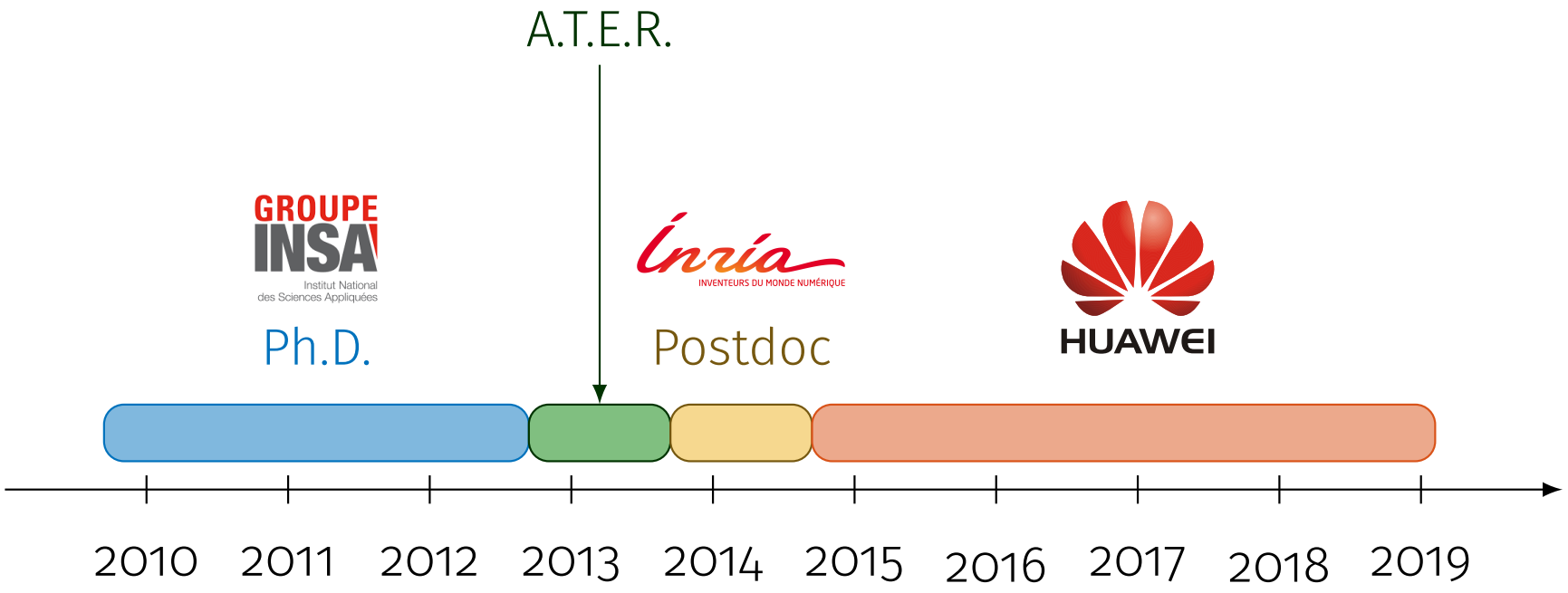
Ph.D. Day / GdR-ISIS

Paul Ferrand

March 2019

My background



Huawei at a Glance

180,000
Employees

80,000
R&D employees

170+
Countries

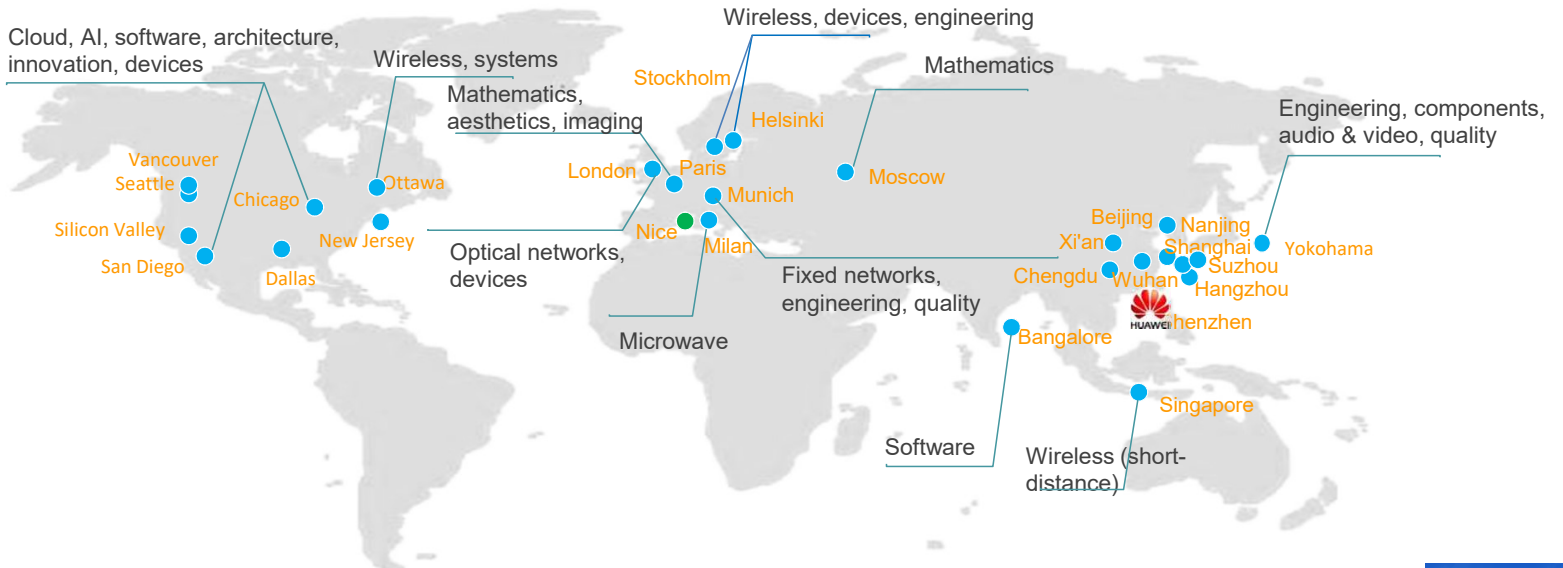
14
R&D
labs/centers

No. 70 in
Interbrand's Top 100
Best Global Brands

No. 83 in the
Fortune Global 500

Huawei corporate presentation

R&D Centers Worldwide: The Best Resources for Innovation




Sweden


UK

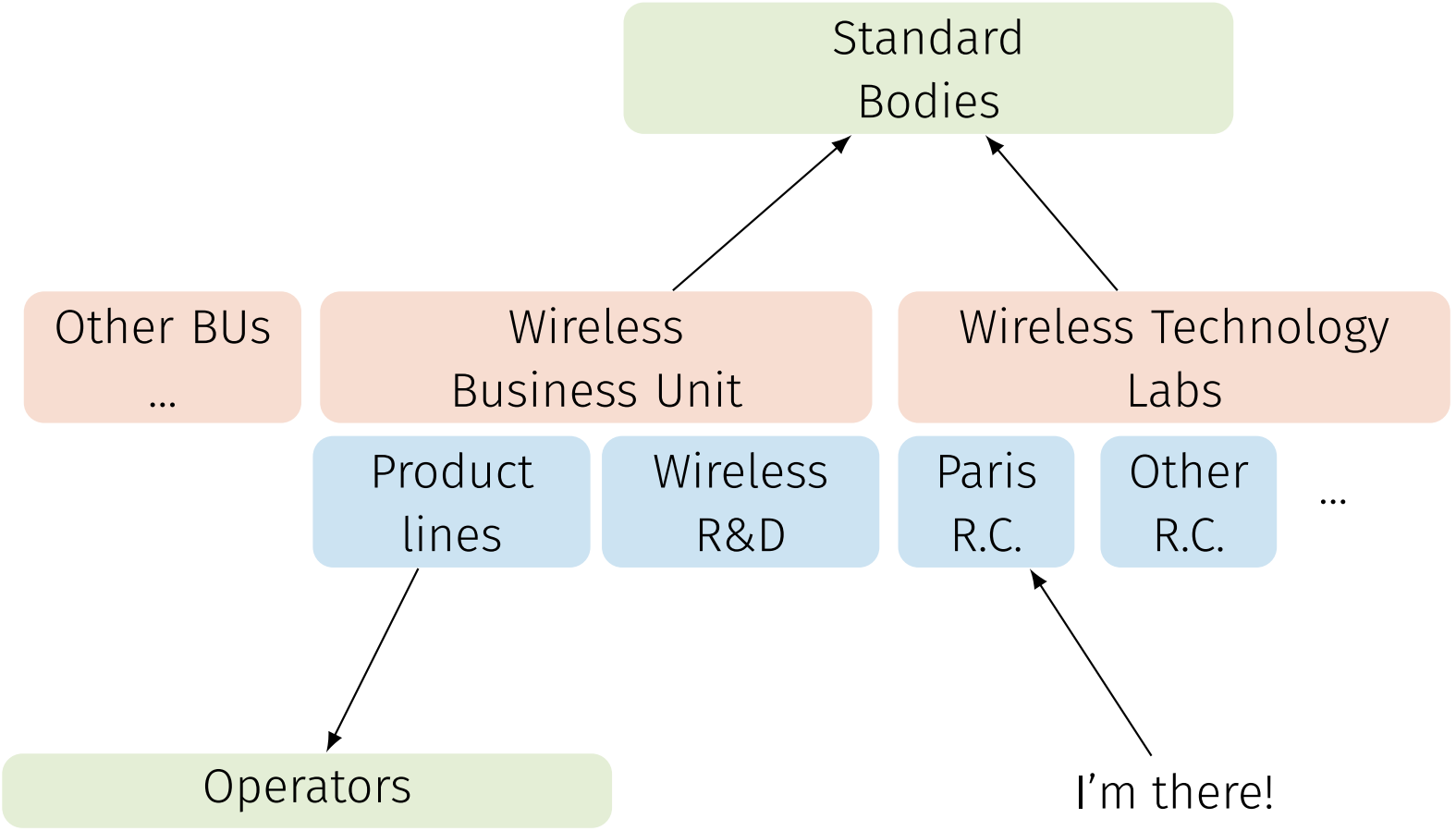

Germany


Russia


Shanghai, China

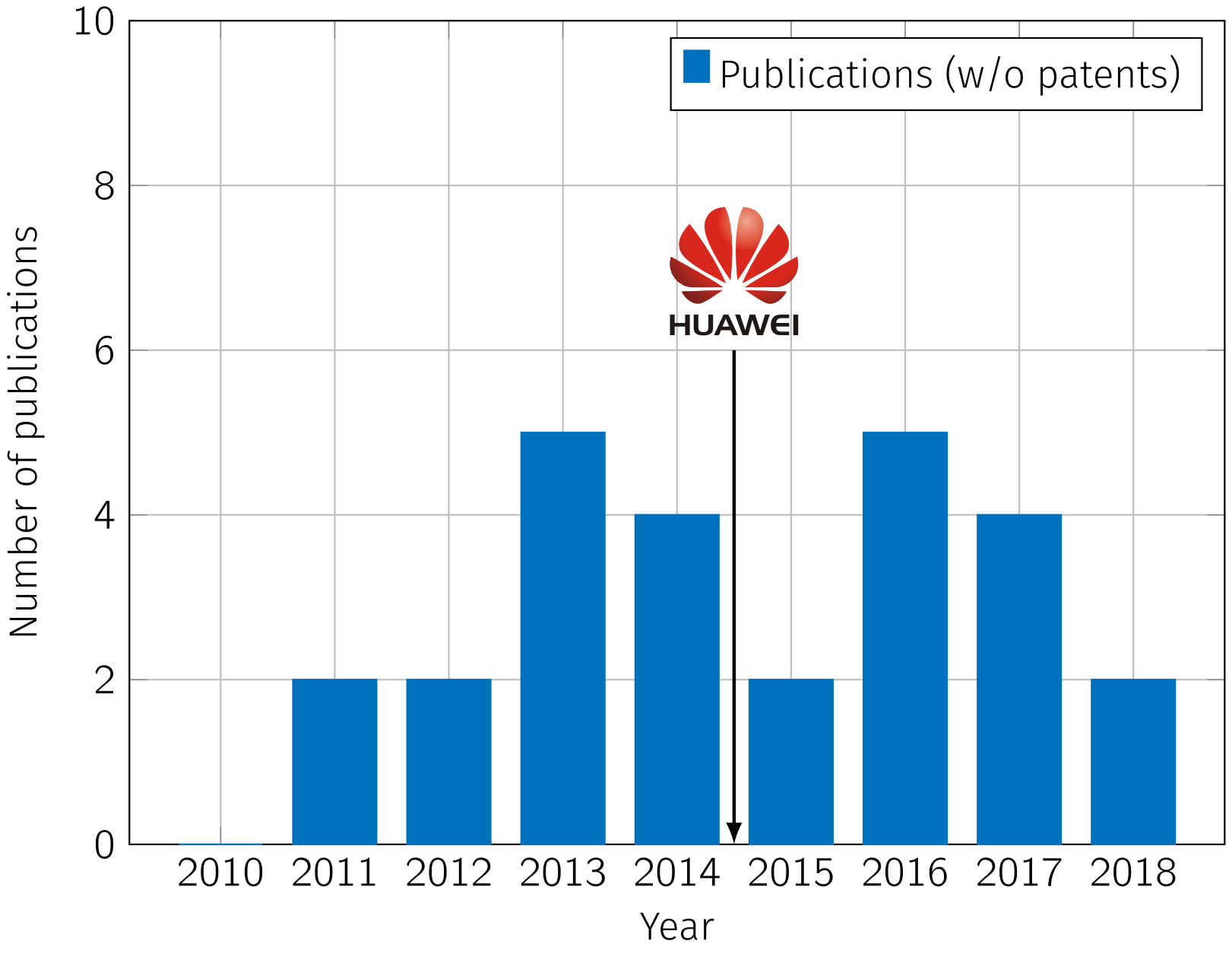

Hangzhou, China

Where am I in there?

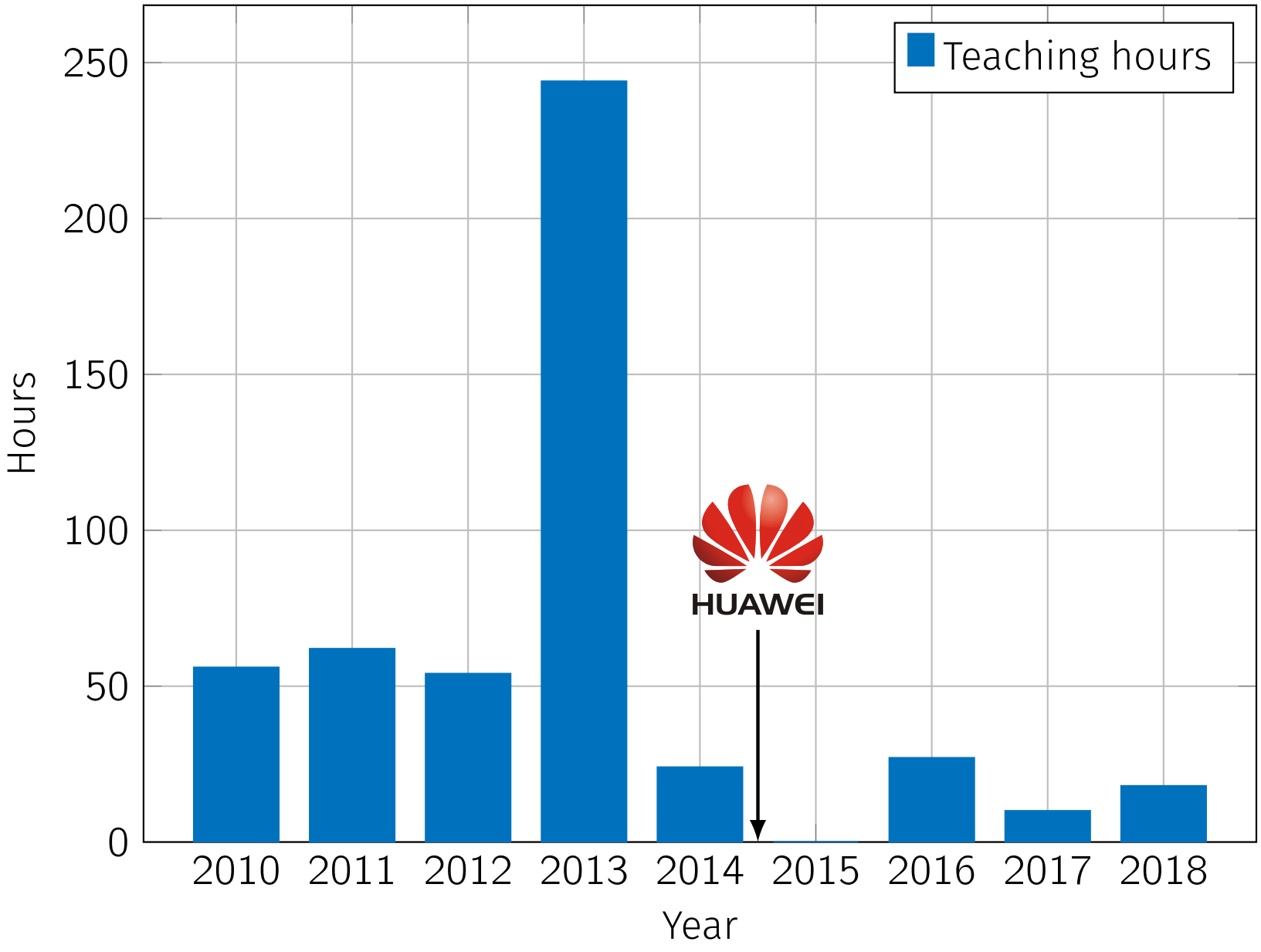


So what's it like?

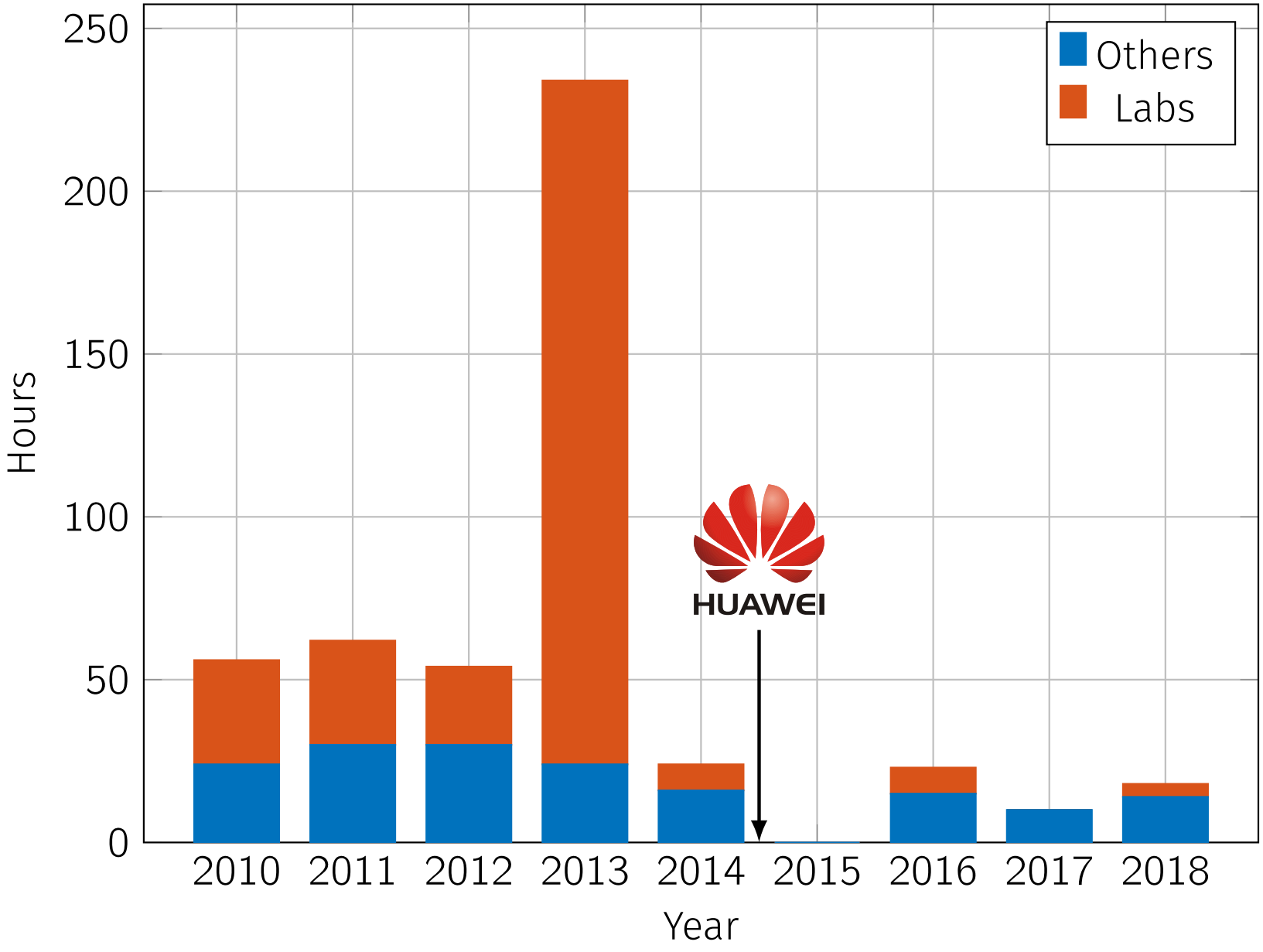
Publications



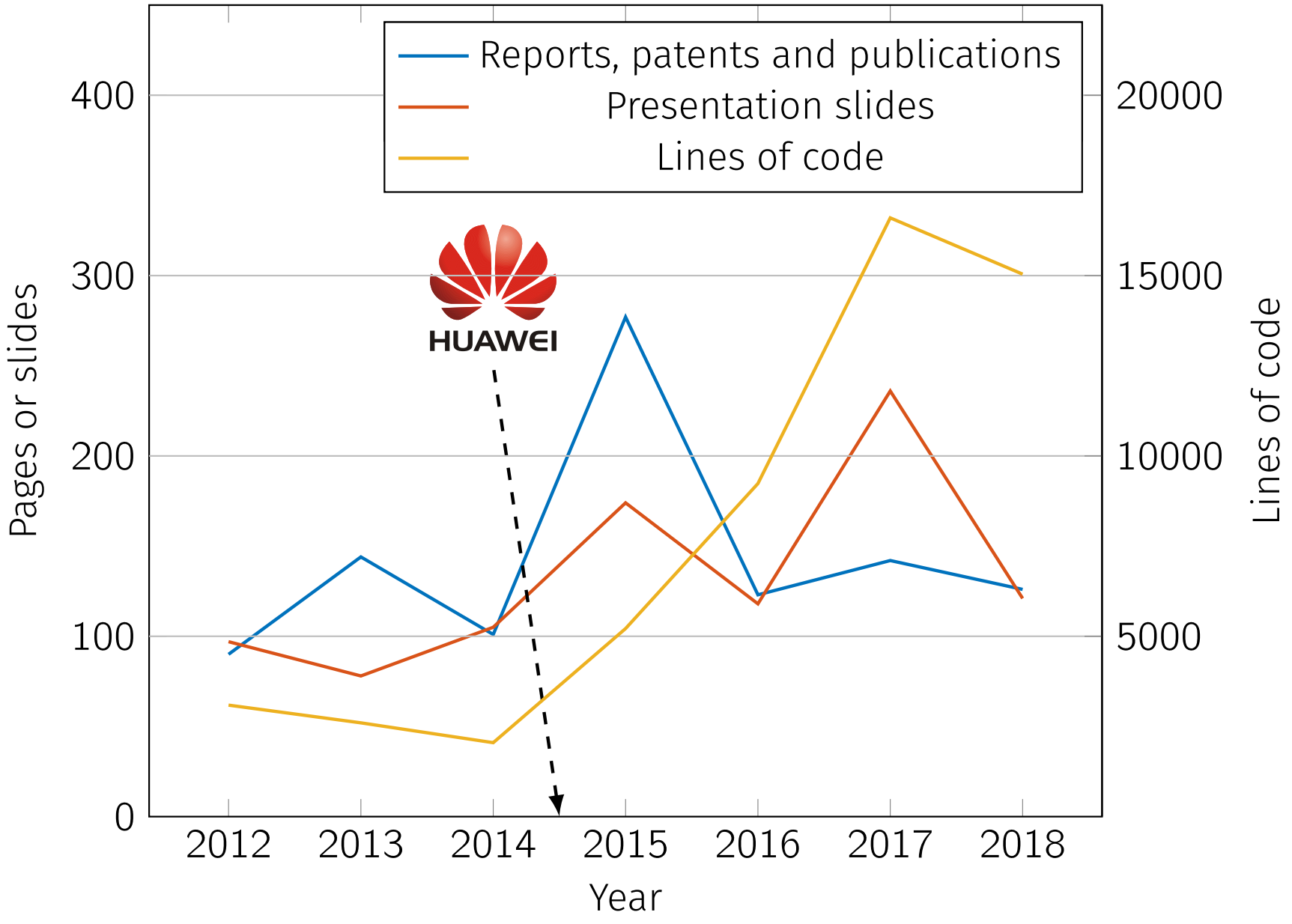
Teaching


Teaching hours
Hours
250
200
150
100
50
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
Year
HUAWEI

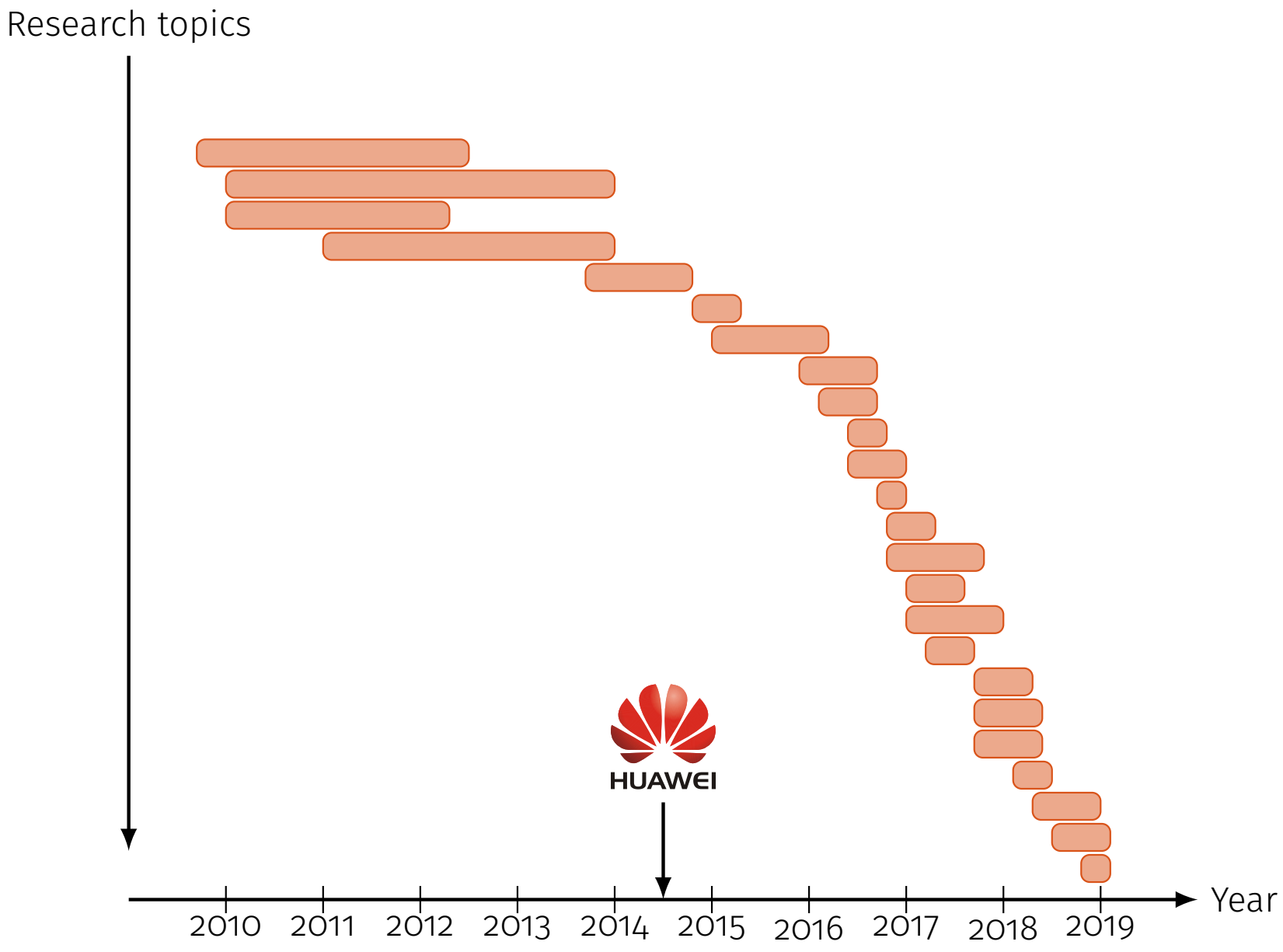
Teaching


250
200
150
100
50
0
Hours
Others
Labs
HUAWEI
2010
2011
2012
2013
2014
2015
2016
2017
2018
Year

Work outputs



Time spent on research topics



Model complexity

Before

System model

In communication systems, fading effects corrupt the amplitude of the envelope of the received signals. We consider the classical *discrete baseband model* from the general continuous multipath fading channel model [See 16, Ch.2]. We use the notation of [16] here and consider a single-tap discrete complex baseband channel model where the signal $y[m]$ received at time m depends on the sent signal $x[m]$, an additive white complex gaussian noise term $w[m] \sim \mathcal{CN}(0, N_0)$ and an aggregate tap gain $h[m]$:

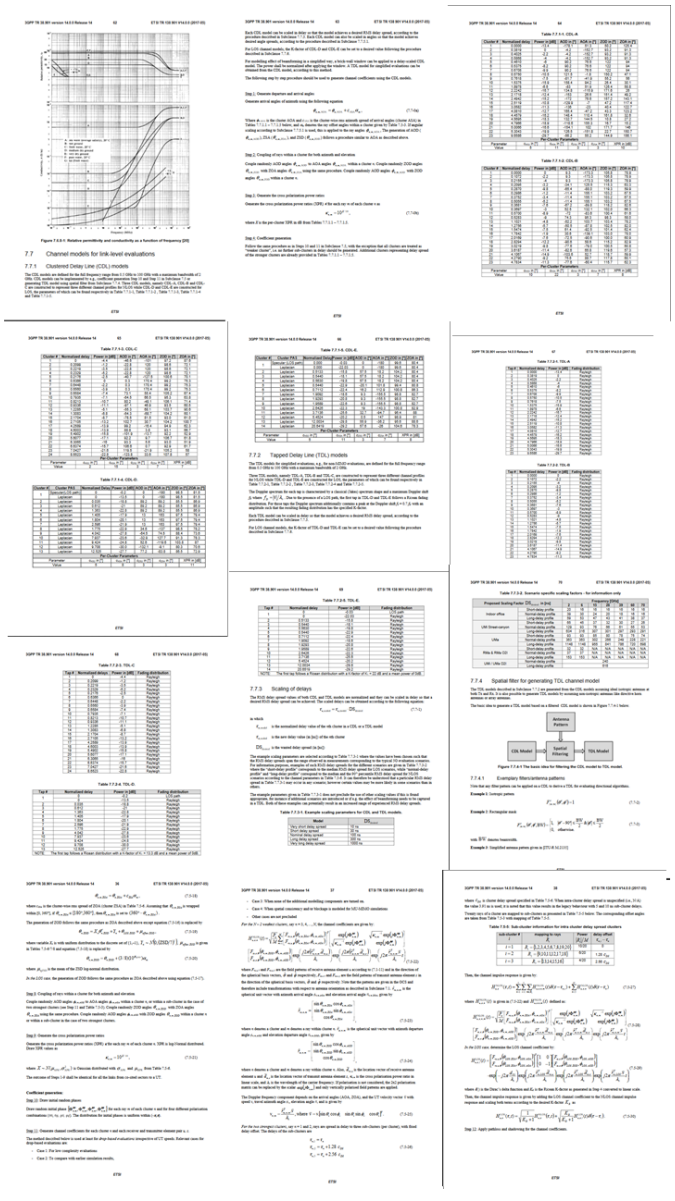
$$y[m] = h[m]x[m] + w[m] \tag{1}$$

P – and with the same power in the case of phase shift keyed (PSK) modulations – the *instantaneous SNR* of the received symbols is :

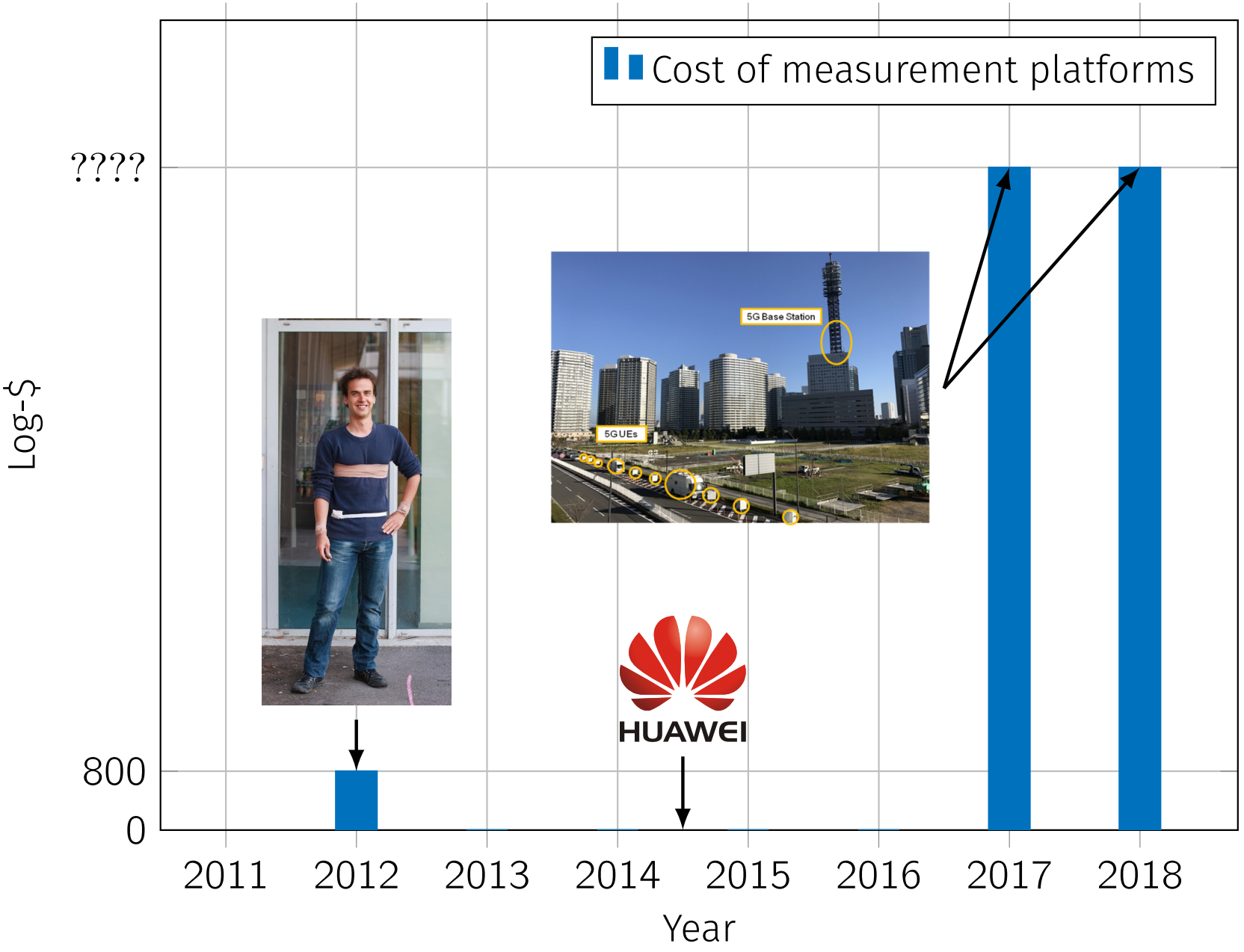
$$\gamma[m] = \frac{|h[m]|^2 P}{N_0} \tag{2}$$

Let $\mathbf{E}[\cdot]$ denote the expectation operator. The *mean SNR* may be computed as $\bar{\gamma} = \mathbf{E}\left[|h[m]|^2\right] \frac{P}{N_0}$, where the expectation is taken over $h[m]$. The effect of fading channels is captured through the probability distribution of the squared aggregate tap gain $|h[m]|^2$, and the usual models we use in this paper may be found in [16, Ch.2] or [1, Ch.3]. The probability density functions (p.d.f.) for these models are summarized in Tab.1.

After



Cost of measurement platforms



So why would anyone hire a Ph.D.?

Why you are stronger than an engineer

- Engineers know their fields, you added to yours.

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- You can summarize vast amounts of knowledge quickly.
- You are trained to abstract and understand what you see, and apply relevant tools to the problem.
- You have some respect for the data and the mathematics.

Thanks!