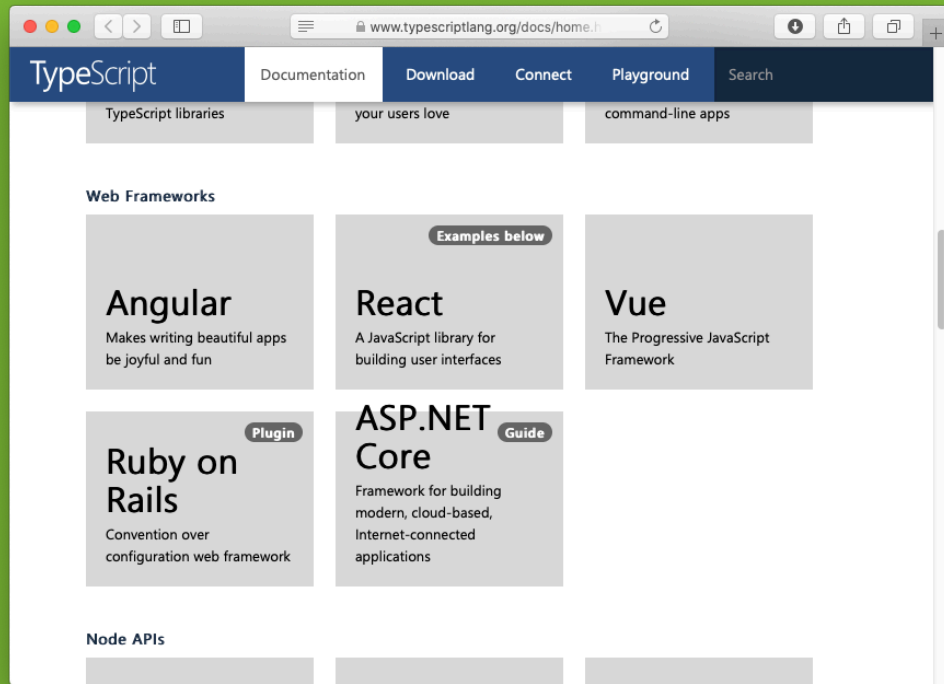


# TypeScript (TS)

Type Safe with TypeScript (TS)

J. Feiner



<https://www.typescriptlang.org/docs/home.html>

# Technology Decisions

## Why TypeScript (and not JavaScript)

	TS (strongly typed)	JS (dynamic typed)	Remarks
History	2012 Hejlsberg, C#, Microsoft	1995 Eich, Netscape, now ECMA	see ECMAScript 2018 and ES.Next
Detect type errors	compile time	run time	
Coding	autocompletion	~	
Toolchain	transpiling necessary	runs natively in browsers	better use static analysis tools for both, JS + TS!

# Technology Decisions

## Why TypeScript (and not JavaScript)

- JavaScript API misuse detection by using typescript
- Safe & efficient gradual typing for TypeScript
- To type or not to type: quantifying detectable bugs in JavaScript
- Type test scripts for TypeScript testing
- Gradual typing embedded securely in JavaScript

<https://doi.org/10.1145/2584469.2584472>

<https://doi.org/10.1145/2676726.2676971>

<https://doi.org/10.1109/ICSE.2017.75>

<https://doi.org/10.1145/3133914>

<https://doi.org/10.1145/2535838.2535889>

# TypeScript (TS)

**Selected Language Features**

**J. Feiner**

# Selected Features: Types, types, types,...

IDE support: Autocompletion, checks (flow analysis), ...  
+ add types for (old) JavaScript libraries

Test features in the online playground  
(check out example "soundness")

<https://www.typescriptlang.org/play/index.html>

# Selected Features:

Optional Chaining `?.`, Nullish Coalescing `??`, Assertions `assert(...)`, never return type, get/set accessors, properties on functions, rest/spread parameters, modules/imports/namespace, protected modifier, type guards (`instanceof`), type alias (`type`), decorators (`@`), `let/const` scoping, mix-in classes, class expressions, abstract classes/methods, promises (`async/await`), .....

? ES6 ~ TS ?

# TypeScript (TS)

**Debugging**

**J. Feiner**

# Debugging

Prepare IDE (e.g. VSCode)

<https://code.visualstudio.com/docs/typescript/typescript-compiling>

Note the Source Maps

Debug for example in Google Chrome