

The slide has a blue grid background. At the top center is the title "ns-2 Tutorial". Below it is the author information: "Haobo Yu, Nader Salehi" and "USC/ISI" followed by the email address "{haoboy,salehi}@isi.edu". A small number "1" is at the bottom center.

The slide has a blue grid background. At the top center is the section title "Overview". Below it is a bulleted list of topics: "Project goals and status", "What is ns", "History and status", and "Seminar schedule". A small number "2" is at the bottom center.

The slide has a blue grid background. The title "Goals" is at the top left. Below it is a bulleted list: "VINT: Virtual InterNet Testbed", "A collaborative simulation platform" (with two sub-points: "Provide common reference → promote sharing" and "Test suites → increase confidence in results"), "Intended audience" (with three sub-points: "Researchers", "Developers", and "Educators"). A small number "3" is at the bottom center.

The slide has a blue grid background. The title "What is NS" is at the top left. Below it is a bulleted list: "Discrete event simulator", "Packet-level", "Link layer and up", and "Wired and wireless". A small number "4" is at the bottom center.

History and Status

- ◆ Columbia NEST
- ◆ UCB REAL
- ◆ ns-1
- ◆ ns-2
 - 100K lines of C++
 - 70K lines of OTcl
 - 30K lines of test suite
 - 20K lines of documentation

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Platforms

- ◆ Most UNIX and UNIX-like systems
 - ✓ FreeBSD or *BSD
 - ✓ Linux
 - ✓ Sun Solaris
 - ? HP, SGI
- ◆ Window 95/98/NT
 - Some work, some does not
- ◆ (Emulation only for FreeBSD for now)

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Related Research

- ◆ intserv/diffserv
- ◆ Multicast
 - Routing
 - Reliable multicast
- ◆ Transport
 - TCP
 - Congestion control
- ◆ Application
 - Web caching
 - Multimedia

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Installation

- ◆ Getting the pieces
 - Tcl/Tk 8.x (8.0.5 preferred):
<http://dev.scriptics.com>
 - OTcl, TclCL, ns-2, nam-1:
<http://www.isi.edu/nsnam/dist>
- ◆ Other utilities
 - <http://www.isi.edu/nsnam/ns/ns-build.html>
 - Tcl-debug, GT-ITM, xgraph, ...

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Getting Help

- ◆ ns-2 build questions
 - <http://www.isi.edu/nsnam/ns/ns-build.html>
- ◆ ns-users@isi.edu (previously ns-users@mash.cs.berkeley.edu)
 - ns-users-request@isi.edu
 - "subscribe ns-users" in body
 - Archive: <http://www.isi.edu/nsnam/ns>

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Resources

- ◆ Tcl (Tool Command Language)
 - <http://dev.scriptics.com/scripting>
- ◆ OTcl (MIT Object Tcl)
 - ~otcl/doc/tutorial.html (in distribution)
- ◆ ns manual
 - Included in distribution: ~ns/doc
 - http://www.isi.edu/~salehi/ns_doc.ps.gz

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Cautions

- ◆ People tried best to validate ns with regression tests
- ◆ **However:** abstraction of the real world is necessary for a simulator
- ◆ You must justify the usage of this simulator based on your research goals

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Workshop Goals

- ◆ Capability of the simulator
 - Design and implementation
 - Complete examples of its usage
- ◆ We try to avoid:
 - Detailed research results

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Workshop Schedule

- ◆ Day 1: OTcl-based simulations
 - Fundamentals: wired and wireless worlds
 - Supporting tools
 - Lab
- ◆ Day 2: C++ and ns
 - ns internal
 - Extending ns
 - Lab

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History and Status

- ◆ Users from approximately
 - 600 institutes
 - 50 countries
- ◆ Releases
 - Periodic releases (currently 2.1b6, Jan 2000)
 - Nightly snapshots (probably compiles and works, but "unstable")
 - Available from: USC/ISI, UC Berkeley, UK mirror

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Functionality of ns

- ◆ Wired world
 - Point-to-point link, LAN
 - Unicast/multicast routing
 - Transport
 - Application layer
- ◆ Wireless
 - Mobile IP
 - Ad hoc routing
- ◆ Tracing, visualization, various utilities

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