# “INTERNSHIP/PROJECT TITLE”

**Industrial Training Report**

*Submitted in Partial Fulfillment of the*

*Requirements for the Degree of*

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE & ENGINEERING**

By

**Student-1 Name (** Roll No: 19MEE002)

**Student-2 Name (** Roll No: 19MEE002)

## Under the Guidance of

## Prof. \_\_\_\_\_\_\_\_\_\_\_\_\_



**Department of** **Computer Science & Engineering,**

**School of Technology, Pandit Deendayal Energy University,**

**Gandhinagar 382 426**

**August 2025**

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### Abstract

(Below is an exemplary Abstract)

The explosive growth of wireless networks, ranging from Wireless Local Area Networks (WLANs) and Wireless Wide Area Networks (WWANs) to Mobile Ad hoc Networks (MANETs) indicates the beginning of “the wireless revolution”. The proliferation of mobile computing and communication devices like cell phones, handheld digital devices, personal digital assistants, laptops or wearable computers is driving a revolutionary change in our information society. We are moving from the Personal Computer age (i.e., a single computing device per person) to the Ubiquitous Computing age in which a user simultaneously utilizes several electronic platforms through which he can access all the required information whenever and wherever needed.

Mobile Ad hoc Networks (MANETs) have become increasingly important as they provide ubiquitous connectivity which is not available with traditional fixed infrastructure networks. Such networks, consisting of potentially highly mobile nodes, have provided new challenges due to the unique characteristics of the wireless medium and the dynamic nature of the network topology. They require robust, adaptive communication protocols that can handle the unique challenges of these multihop networks smoothly. The TCP has been widely deployed as transport layer protocol on a multitude of internet works including the Internet, for providing reliable end-to-end data delivery. It is naturally viewed as the *de facto* reliable transport protocol for use in MANETs. As in the Internet it is desirable that TCP must provide reliable data transfer services for communication within wireless networks and also between wireless networks and wired Internet. However, assumptions made during TCP development reflected characteristics of the prevalent wired infrastructure of networks at the time and subsequently leads to sub-optimal performance when used in wireless ad hoc environments as observed in the simulation results. Transport protocol in an ad hoc network must handle mobility-induced disconnection and reconnection, route change-induced packet out-of-order delivery for mobile hosts, and error/contention-prone wireless transmissions. Modifying TCP to improve its performance in wireless networks has been a long-standing research problem. Many methods have been proposed to improve TCP's performance in MANETs. Among them Ad hoc TCP (ADTCP) uses an end-to-end approach which is easy to implement and deploy since it requires minimal changes at the sender and receiver, provides the flexibility for backward compatibility and is TCP-friendly. To further improve the performance of ADTCP we consider following: ensure sufficient bandwidth utilization of the sender-receiver path, avoid the overloading of network and check for incipient congestion and take appropriate actions. For this we limit TCP’s congestion widow below the BDP-UB (Upper Bound of BDP) of sender-receiver path, i.e its maximum packet carrying capacity.

The project is an attempt to improve the performance of ADTCP in MANETs by estimating the optimum window size and then setting congestion window limit to an optimum value.

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## NOMENCLATURE

|  |  |
| --- | --- |
| A | Energy level indicator |
| B | Bottom product rate, kmol/hr |
|  |
| **Greek** |
| θ | Root of Underwood equation |
| α | Relative volatility |
| λ | Latent heat of vaporization, kcal/kmol |
|  | Difference |
| ε | Energy change indicator |
|  |
| **Subscripts** |
| min | Minimum |
| i | Any component |
|  |  |
| **Abbreviations** |
| CGCC | Column Grand Composite Curves |
| IRS | Invariant Rectifying Stripping |
| CMO | Constant Molar Overflow |

**Chapter 1**

**Introduction**

**1.1 Prologue**

MANETs have become increasingly important in view of their promise of ubiquitous connectivity beyond traditional fixed infrastructure networks. They represent complex distributed systems that comprise wireless mobile nodes that can freely and dynamically self-organize into arbitrary and temporary, ‘‘ad hoc’’ network topologies **[1].**

* Mention the number in square bracket [ ] as per the reference listed in the reference section.

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* Last three chapters should be (i) Result and Discussions (ii) Conclusion (iii) Future Prospects

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**NOTE:** Use *et al.* when three or more names are given.

***Examples:***

1. B. Klaus and P. Horn, *Robot Vision.* Cambridge, MA: MIT Press, 1986.
2. L. Stein, “Random patterns,” in *Computers and You,* J. S. Brake, Ed. New York: Wiley, 1994, pp. 55-70.
3. R. L. Myer, “Parametric oscillators and nonlinear materials,” in *Nonlinear Optics*, vol. 4, P. G. Harper and B. S. Wherret, Eds. San Francisco, CA: Academic, 1977, pp. 47-160.
4. M. Abramowitz and I. A. Stegun, Eds., *Handbook of Mathematical Functions* (Applied Mathematics Series 55). Washington, DC: NBS, 1964, pp. 32-33.

**Handbooks**

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1. *Name of Manual/Handbook*, *x* ed., Abbrev. Name of Co., City of Co., Abbrev. State, year, pp. *xx-xx.*

***Examples:***

1. *Transmission Systems for Communications*, 3rd ed., Western Electric Co., Winston Salem, NC, 1985, pp. 44–60.
2. *Motorola Semiconductor Data Manual*, Motorola Semiconductor Products Inc., Phoenix, AZ, 1989.
3. *RCA Receiving Tube Manual*, Radio Corp. of America, Electronic Components and Devices, Harrison, NJ, Tech.Ser. RC-23, 1992.

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1. E. E. Reber *et al*., “Oxygen absorption in the earth’s atmosphere,” Aerospace Corp., Los Angeles, CA, Tech. Rep. Angeles, CA, Tech. Rep. TR-0200 (4230-46)-3, Nov. 1988.
2. J. H. Davis and J. R. Cogdell, “Calibration program for the 16-foot antenna,” Elect. Eng. Res. Lab., Univ. Texas, Austin, Tech. Memo. NGL-006-69-3, Nov. 15, 1987.
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4. M. A. Brusberg and E. N. Clark, “Installation, operation, and data evaluation of an oblique-incidence ionosphere sounder system,” in “Radio Propagation Characteristics of the Washington-Honolulu Path,” Stanford Res. Inst., Stanford, CA, Contract NOBSR-87615, Final Rep., Feb. 1995, vol. 1.

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1. J. K. Author, “Title of patent,” U.S. Patent *x xxx xxx*, Abbrev. Month, day, year.

***Example:***

1. J. P. Wilkinson, “Nonlinear resonant circuit devices,” U.S. Patent 3 624 125, July 16, 1990.

**NOTE:** Use “issued date” if several dates are given.

**Standards**

***Basic Format:***

1. *Title of Standard*, Standard number, date.

***Examples:***

1. *IEEE Criteria for Class IE Electric Systems*, IEEE Standard 308, 1969.
2. *Letter Symbols for Quantities*, ANSI Standard Y10.5-1968.

**Theses (M.S.) and Dissertations (Ph.D.)**

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***Examples:***

1. J. O. Williams, “Narrow-band analyzer,” Ph.D. dissertation, Dept. Elect. Eng., Harvard Univ., Cambridge, MA, 1993.
2. N. Kawasaki, “Parametric study of thermal and chemical nonequilibrium nozzle flow,” M.S. thesis, Dept. Electron. Eng., Osaka Univ., Osaka, Japan, 1993.
3. N. M. Amer, “The effects of homogeneous magnetic fields on developments of tribolium confusum,” Ph.D. dissertation, Radiation Lab., Univ. California, Berkeley, Tech. Rep. 16854, 1995.
4. C. Becle, These de doctoral d’etat, Univ. Grenoble, Grenoble, France, 1968.

**Unpublished**

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1. J. K. Author, private communication, Abbrev. Month, year.
2. J. K. Author, “Title of paper,” unpublished.

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1. D. Harrison, private communication, May 1995.
2. Y. Smith, “An approach to graphs of linear forms,” unpublished.

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1. J. K. Author, “Name of paper,” *Abbrev. Title of Periodical*, vol. *x,* no. *x,* pp*. xxx-xxx,* Abbrev. Month, year.

***Examples:***

1. R. E. Kalman, “New results in linear filtering and prediction theory,” J. Basic Eng., ser. D, vol. 83, pp. 95-108, Mar. 1961.
2. E. P. Wigner, “On a modification of the Rayleigh–Schrodinger perturbation theory,” (in German), Math. Naturwiss. Anz. Ungar. Akad. Wiss., vol. 53, p. 475, 1935.
3. E. H. Miller, “A note on reflector arrays,” IEEE Trans. Antennas Propag..., to be published.\*\*
4. C. K. Kim, “Effect of gamma rays on plasma,” submitted for publication. \*\*
5. W. Rafferty, “Ground antennas in NASA’s deep space telecommunications,” Proc. IEEE vol. 82, pp. 636-640, May 1994.

**Appendix**

(if applicable)

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